JUNE · 1950

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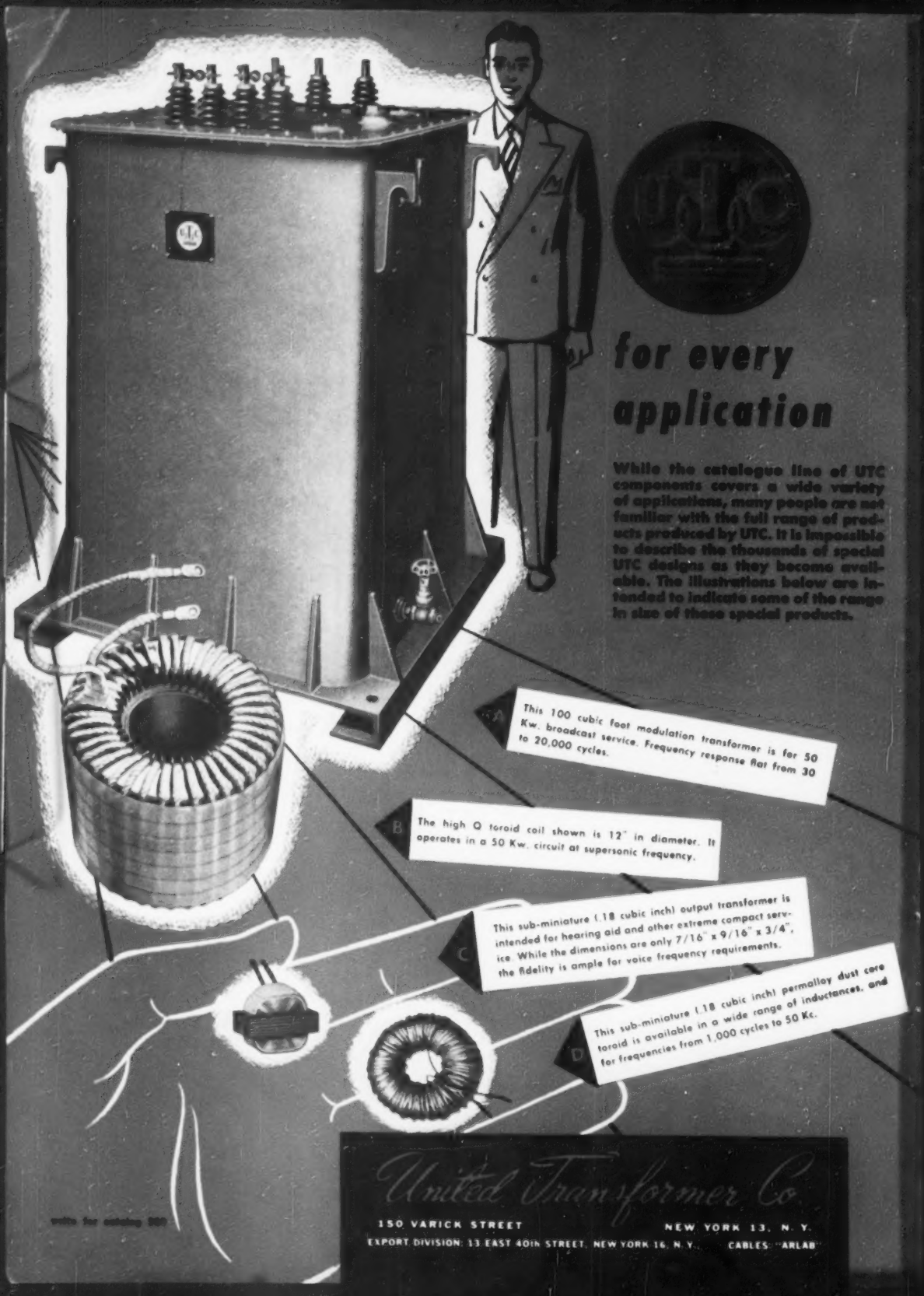
500-KW BEAM TRIODE



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A — This 100 cubic foot modulation transformer is for 50 Kw. broadcast service. Frequency response flat from 30 to 20,000 cycles.

B — The high Q toroid coil shown is 12" in diameter. It operates in a 50 Kw. circuit at supersonic frequency.

C — This sub-miniature (.18 cubic inch) output transformer is intended for hearing aid and other extreme compact service. While the dimensions are only 7/16" x 9/16" x 3/4", the fidelity is ample for voice frequency requirements.

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500-KW BEAM TRIODE ..... Cover
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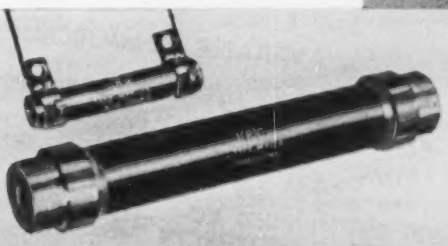

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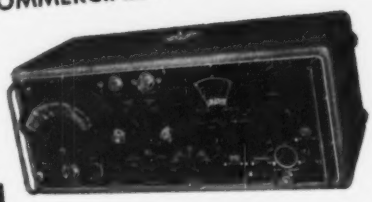

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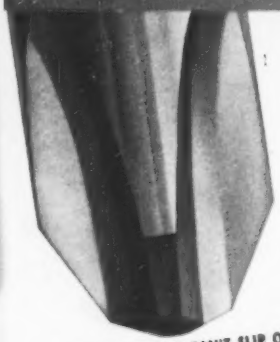

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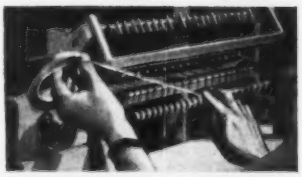

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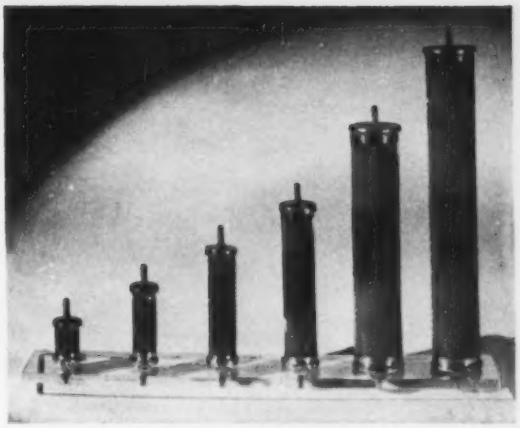

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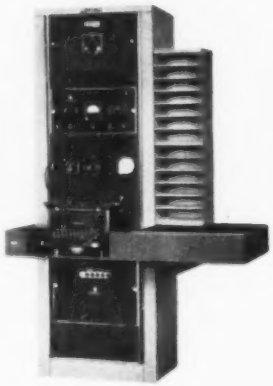

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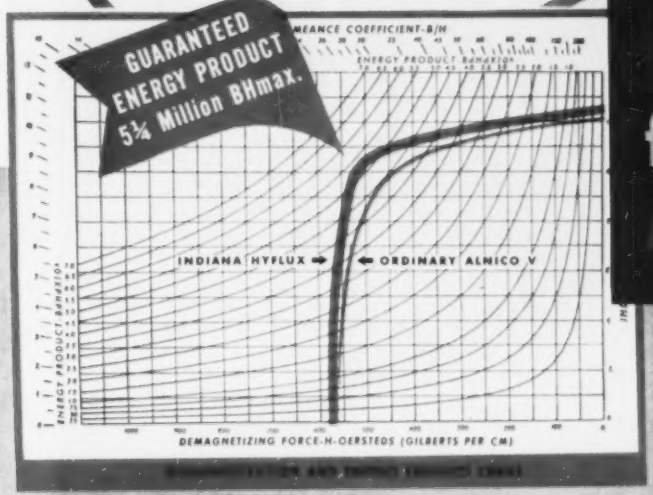
...with New INDIANA HYFLUX PERMANENT MAGNETS

Now 22% More Energy for Alnico V AT NO EXTRA COST


GUARANTEED ENERGY PRODUCT 5¼ Million BHmax.
INDIANA HYFLUX
ORDINARY ALNICO V
DEMAGNETIZING FORCE-H-OERSTEDS (GILBERTS PER CM)

The Stronger Magnets you've been hoping for ARE HERE!

Now it can be told! After years of research and months of field-testing, INDIANA announces exclusive new *super-strength permanent magnets* made of HYFLUX Alnico V.

The industry's highest published guaranteed energy product for standard Alnico V has been 4½ million BHmax. Now, INDIANA guarantees much greater strength—5¼ million BHmax, and the *average* energy product reaches 5½ million BHmax, or more. Yet, for these higher-energy HYFLUX magnets, you pay *not a penny* premium.

What is HYFLUX Alnico V? INDIANA HYFLUX is *not* a new alloy. It's the result of a new precision technique applied to *dependable* Alnico V . . . new procedures, controls, instrumentation, and equipment, and *precise supervision* over every step of production. Add to this the 42 years of permanent magnet experience and a long-term training program for personnel by the world's *largest* exclusive producer, and you have the background and reasons why INDIANA HYFLUX is so outstanding in *both* performance and value.

Find Out What HYFLUX Can Do! For *greater strength* . . . more compact designing . . . for the lower production costs these smaller, better magnets can bring to *your own* products, get all the facts today on amazing INDIANA HYFLUX. It's the *most important development* in permanent magnets since the introduction of Alnico V.

See what HYFLUX *does!*

When this standard R. M. A. No. 5 loud speaker magnet is INDIANA HYFLUX Alnico V with the minimum guaranteed energy product of 5¼ million BHmax, it has .7 decibels greater output than when made with 4½ million BHmax *regular* Alnico V. Similar improvements—in strength or size—apply to *all* applications. INDIANA HYFLUX is ready now to bring *you* these advantages.

For Cost-Cutting Engineering Aid, Put Your Magnet Problems up to INDIANA.

THE INDIANA STEEL PRODUCTS COMPANY

Specialists in Packaged Energy Since 1906

SALES OFFICES: BOSTON, CHICAGO, CLEVELAND, LOS ANGELES, NEW YORK, PHILADELPHIA, ROCHESTER

INDIANA PERMANENT MAGNETS

THE INDIANA STEEL PRODUCTS COMPANY
DEPT. E-60, VALPARAISO, INDIANA

Please send me all the facts on INDIANA HYFLUX. I am interested in permanent magnets for:

.....

.....

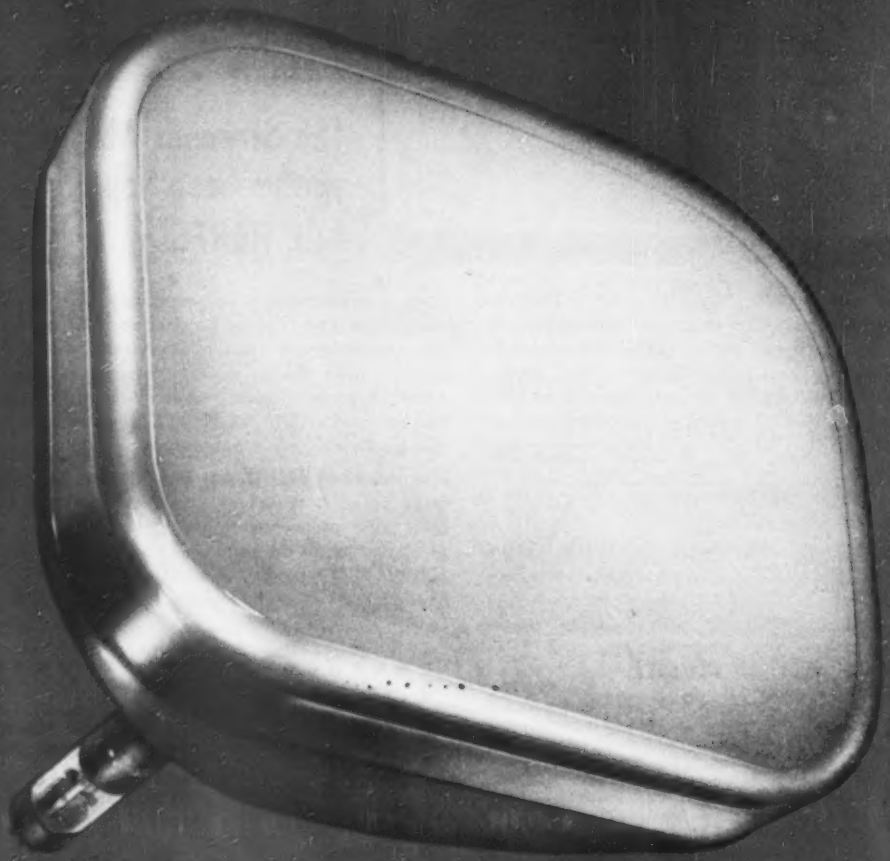
Name .....

Company .....

Street .....

City .....*Zone*.....*State*.....

Federal
Announces



A NEW LONG-LIFE TELEVISION TUBE

High in Light Output!

Produced with the Newest and Most Advanced Type Equipment in the TV Industry

KINESCOPES BY
Federal
Perform Better... Last Longer
Federal Kinescope Types
RECTANGULAR SCREEN:
14", 16", 17", 19"
ROUND SCREEN: 12½", 16", 19"

Here's the precisely *right* tube for TV. Here's tube design based on more than forty years' tube manufacturing experience. It's Federal's New-Day Kinescope, introducing a new high in *light* output and fine performance.

Federal's Kinescope is the new over-all advanced design embodying the ion-trap type electron gun. Magnetically focused, magnetically deflected, delivering the sharpest contrast and picture definition, it assures the user quality-first pictures, quality-first performance. For complete details, write to Dept. K413.

FEDERAL TELECOMMUNICATION LABORATORIES, Nutley, N. J. a unit of I T & T's world wide research and engineering organization

BACKED BY MORE THAN FORTY YEARS' TUBE MANUFACTURING EXPERIENCE

Federal Telephone and Radio Corporation

VACUUM TUBE DIVISION, 100 Kingsland Road, Clifton, New Jersey
In Canada: Federal Electric Manufacturing Company, Ltd., Montreal, P. Q.
Export Distributors: International Standard Electric Corp., 67 Broad St., N. Y.

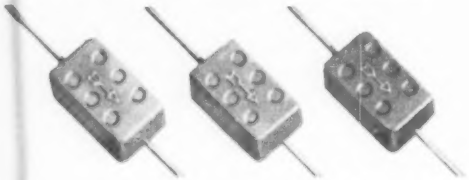
Big Chief Sangamo Says:

Little Injuns Heap Big Help!

If you need capacitors that will do a "heap big" job in a *minimum* of space to speed your production—these Sangamo Micas and Buttons are your best bet. Space problems can be easily solved without sacrifice of stability or high quality.

For detailed information on Button Micas write for Catalog No. 830. Sangamo's new Catalog No. 800 gives full information on the whole Sangamo Tribe.

Type RR Miniature Silvered Mica Capacitors



The Sangamo "Shawnee", Type RR Miniature Silvered Mica Capacitor, is designed and constructed to meet all requirements specified in the tentative JAN-C-5A specification for the CM-15 case size. Exceptionally small, the Sangamo "Shawnee" will measure up to your toughest requirements.

Type M Silvered Mica Button Capacitors

Sangamo Silvered Mica Button Capacitors are available in a wide variety of sizes and styles in capacitance ranges from 10 mmfd. to 7000 mmfd. and meet all requirements of component capacitors for V. H. F. and U. H. F. applications. Sangamo Button Capacitors are fabricated with silvered mica to provide high conductivity. They are completely sealed against humidity, and have a very low temperature coefficient.

Your Assurance of The SANGAMO Tribe *Dependable Performance!*

PAPER-MICA-SILVER-ELECTROLYTIC CAPACITORS

SANGAMO ELECTRIC COMPANY

SPRINGFIELD, ILLINOIS

IN CANADA: SANGAMO COMPANY LIMITED, LEASIDE, ONTARIO

NEW hp 460A WIDE BAND AMPLIFIER

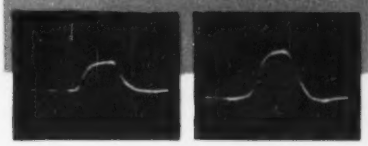


Figure 1

Actual photo of oscillograph trace showing .01 μsec pulse (left) applied direct to CRT plates; (right) through -hp- 460A.

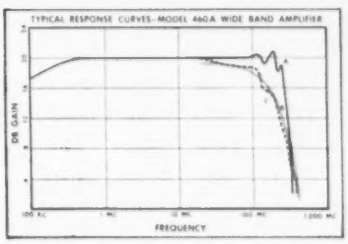


Figure 2

Typical response curves. Line A, with -hp- 410A VTVM. Line B, into 200 ohm load. Line C, Gaussian curve.

SPECIFICATIONS

Frequency Response: *High frequency* — closely matches Gaussian curve when operating into a 200 ohm resistive load. 3 db point is 140 mc.

Low frequency — when operating from a 200 ohm source and .01 blocking condenser, response off 3 db at 3 kc into an open circuit or succeeding amplifier. When operating into a 200 ohm load, off 3 db at 100 kc.

With -hp- 410A VTVM: ±1 db, 200 kc to 200 mc.

Gain: Approx. 20 db into 200 ohm load, with tubes of G_m 5,000 micromhos. (When operating into 200 ohm load.) Gain control has range of 6 db. 5 or more amplifiers may be cascaded.

Output: Approx. 8 v. peak open circuit. Output impedance, 330 ohms.

Input Impedance: 200 ohms.

Delay Characteristics: Approx. .012 μsec.

Rise Time: Approximately .0026 μsec (10% to 90% amplitude). No appreciable overshoot.

Mounting: Relay rack, 5¼" x 19" x 6" deep.

Power Supply: 115 v. 50/60 cps, self-contained.

Data subject to change without notice.

SETTING A NEW STANDARD FOR *FAITHFUL* PULSE AMPLIFICATION!

True amplification of very short pulses. Rise time .0026 microseconds; 20 db gain; can be cascaded. For oscilloscope, TV, UHF, nuclear or general laboratory work. Increases voltmeter sensitivity 10 times over 200 mc band.

The new -hp- 460A Wide Band Amplifier is the first instrument of its kind to offer you *faithful amplification* of very short pulses without objectionable ringing or overshoot. The rise time of the amplifier itself is only .0026 microseconds; and its response matches the Gaussian curve (transmission ideal) more closely than any other instrument yet offered.

The exactness with which the new -hp- 460A amplifies very short pulses can be seen in Fig. 1. Left: shows a .01 μsec pulse applied direct to plates of a 5XP11A cathode ray tube. Right: same pulse after passing through the -hp- 460A. Note the very short rise time and the absence of ringing or overshoot. Fig. 2, illustrates how closely the -hp- 460A conforms to the Gaussian ideal. As many as 5 amplifiers can be cascaded when high gain is necessary.

GENERAL AMPLIFIER

Fig. 2 also illustrates the wide frequency response of this instrument. It offers flat response up to 200 mc when used with the -hp- 410A Vacuum Tube Voltmeter. Sensitivity is increased 10 times. The -hp- 460A may also be used as a general purpose laboratory amplifier.

ACCESSORIES

Since the -hp- 460A Amplifier operates best at impedances of 200 ohms, -hp- has designed a 200 ohm coaxial system of connectors and cables. These accessories include leads with fittings, panel jacks and plugs, adapters to connect into a 50 ohm Type N system; and a special adapter for use with the -hp- 410A Voltmeter.

Get complete information now! See your nearest -hp- representative or write to factory.

HEWLETT-PACKARD CO.
1936-A Page Mill Road, Palo Alto, California
Export: FRAZAR & HANSEN, LTD.
301 Clay Street, San Francisco, Calif., U. S. A.
Offices: New York, N. Y.; Los Angeles, Calif.

hp laboratory instruments
FOR SPEED AND ACCURACY

NEW MANUALLY-OPERATED "STICK" WINDER GETS "ELECTRICAL MANUFACTURING" DESIGN AWARD - UNIVERSAL NO. 108

A fully automatic coil winding machine pays its way only when the runs are long enough to justify the expense of the set-up time required.

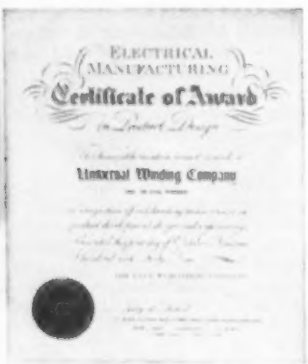
Since many coil lot sizes are small, only a portion of the market requirements can be filled economically by the use of automatic machinery.

This situation, together with the obsolete condition of many of the manually-operated winders in the electrical and electronic parts industries created the necessity for developing a manually-operated winder of *modern* design to supplement the automatic type.

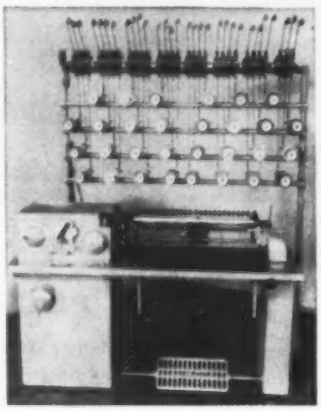
No. 108 COIL WINDER

The No. 108 Coil Winder was developed by the Universal Winding Company to meet the demand for a modern manually-operated machine to wind paper-insulated coils in multiple or "stick" form.

Its design received an Honorable Mention Award in the 11th Annual Product Design competition sponsored by "Electrical Manufacturing."



The objective of Universal engineers was to produce an integrated unit, clean and functional, with labor-saving features which would warrant replacement of present equipment, and with a selling price low enough to be attractive to the predominantly "job shop" type of market characteristic of the ever-changing electrical and electronic parts industries.



No. 108 Coil Winder.

After extensive field surveys and an analysis both of suggestions made by electrical engineers, superintendents and operators, and of their criticisms of existing machinery, our engineers determined upon the basic principles for the 108 Coil Winder that are incorporated in the following outstanding features.

Quick Set-Up All machine functions are built around the idea that quick set-up and finger-tip control are the best means of creating savings in the use of skilled labor during machine set-up.

Flexibility The machine can be adjusted quickly to accommodate changing requirements of wire size, coil length and diameter.

Note convenience of controls.

Accessibility Operations involved in preparing and finishing coils vary from job to job, but access to the coil stick is completely unhampered and all coils are readily processed. Accessibility features are also provided for ease of maintenance and adjustment.

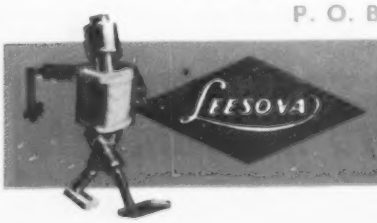
Simplicity Since operators of this type of machine are usually women and may be disturbed by any complexity of controls and adjustments, the simple external appearance of this machine promotes confidence.

Cost Compared with an automatic machine winding the same type of coils, the cost of this machine is very modest, considering its efficiency and the high quality of its construction.

Bed The bed is a single casting, extending the full length of the machine, and is of aluminum to cut down weight. The supporting columns are made of single steel sheets, formed and welded and are braced at the bottom by steel straps which serve as feet. The left-hand one houses the motor and drive mechanism and the right-hand one is a cupboard for the operator's personal belongings.

For free literature on design features, write for "Getting the Most from Coil Winding No. 14."

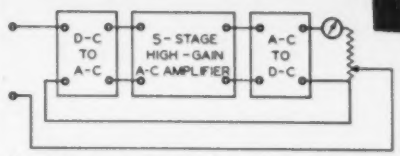
UNIVERSAL WINDING COMPANY
P. O. Box 1605 Providence 1, R. I.
* REG. U. S. PAT. OFF.



FOR WINDING COILS IN QUANTITY
ACCURATELY . . . AUTOMATICALLY
USE UNIVERSAL WINDING MACHINES

For low-level d-c measurements Use these new, triple-purpose D-C INDICATING AMPLIFIERS

stabilized for zero and gain



Voltage-balance feedback (above) and current-balance feedback stabilize gain . . . provide virtual null balance.

SPECIFICATIONS

MICROVOLT UNIT	MICRO-MICRO-AMPERE UNIT
Catalog No. 9835	Catalog No. 9836
FULL SCALE RANGES WITH BUILT-IN 4" METERS	
0 to 50 or −25 to +25 Microvolts; scale multipliers: 1,2,4,10, 20,40	0 to 1000 or −500 to +500 Micro-Micro-amps; scale multipliers: 1, 2, 5, 10, 20, 50, 100, 200, 500, 1000, 2000
ACCURACY	
Of amplifier: ±0.4% of reading ±0.5 Microvolt; Of meter: ±1%	Of amplifier: ±0.5 to 0.8%* of reading ±20 Micro-Micro-amps; Of meter; ±1%

STABILITY

Zero and Gain stabilized automatically. No trimmer controls required.

*SOURCE RESISTANCE	
Up to 10,000 ohms.	0.1 megohm or more.
RESPONSE TIME	
2 to 3* sec.	2 to 3* sec.

OUTPUT

For full scale input on any range. 10 millivolts at output impedance of 500 ohms for null recorder; 1 volt for 20,000-ohm external meter.

Front panel fits standard 19" relay rack.

*Accuracy and Response Time depend on Source Resistance.

USE AS

- **DIRECT-READING MICROVOLTMETER OR MICRO-MICROAMMETER**
- **RECORDER PREAMPLIFIER**
- **NULL DETECTOR**

These new instruments are not only D-C Indicating Amplifiers but are stable, accurate measuring instruments as well. You can use them in measurements with thermocouples, strain gages, bolometers . . . bridge and potentiometer circuits . . . ionization, leakage, and phototube currents . . . almost any measurement of extremely small direct current or voltage.

Through a combination of a-c amplification and unique balanced feedback network, zero and gain stability are designed right into the instrument. Trimmer controls are designed out—eliminated.

Actually *three* instruments in one, these amplifiers can be used as—

Direct-reading instruments . . . At the turn of a scale-multiplier knob, you simply select the range in which you want to work.

Recorder preamplifiers . . . with broad flexibility. For instance, one or two degrees of temperature difference can be spread across an entire Speedomax recorder scale.

Null detectors . . . more sensitive than most reflecting galvanometers, yet with full scale response time of only 2 to 3 seconds. Leveling is unnecessary. There's no worry about shock or vibration. At the turn of a range knob, you have available a wide choice of sensitivities. External shunts are not required. And when using non-linear response, not only does the instrument stay on scale at extreme unbalance; sensitivity increases automatically as the null point is approached. For details, write to Leeds & Northrup Co., 4979 Stenton Ave., Phila. 44, Pa.

MEASURING INSTRUMENTS · TELEMETERS · AUTOMATIC CONTROLS · HEAT-TREATING FURNACES

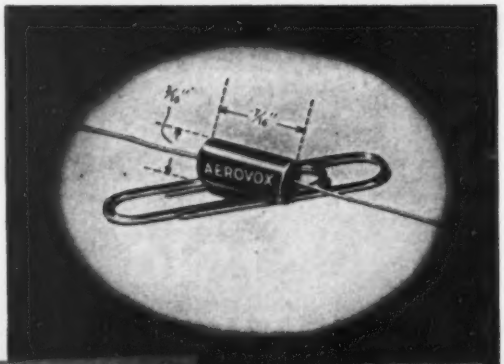
LEEDS & NORTHRUP CO.

SMALLER THAN PREVIOUS "SMALLEST"...

PREDETERMINED ACCURACY...

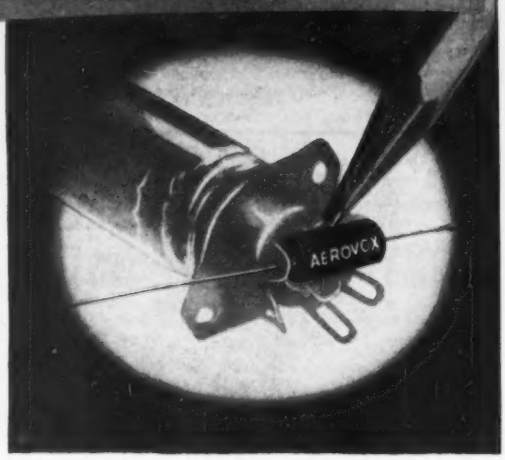
REMARKABLE STABILITY...

EXCEPTIONAL CHARACTERISTICS...



AEROVOX MICRO-MINIATURES

(TYPE P83Z AEROLITE* CAPACITORS)



• Smaller than a paper clip! Only 3/16" dia. by 7/16" long! Yet rugged, accurate, stable, exceptional.

Such is the story of Aerovox Micro-miniatures (Type P83Z Capacitors). Smaller physical size directly due to radically new *metallized dielectric*—a distinct departure from conventional foil-paper and previous metallized-paper constructions. Dielectric and electrodes combined *in one element*. Smallest capacitor available for capacitance range.

Aerovox Micro-miniatures are particularly applicable to radio-electronic miniaturization calling for high-frequency and by-pass coupling.

• ***Try Aerovox Micro-miniatures in your miniaturized assemblies. Write Dept. FD-450 for engineering data, samples, quotations, and application engineering aid.***

F E A T U R I N G . . .

One size for all ratings—3/16" dia. by 7/16" long.

Hyvol K impregnated in humidity-resistant molded thermoplastic cases.

Operating temperature range from −15° C. to +85° C. without derating.

Power factor less than 1% when measured at or referred to frequency of 1000 cps and ambient temperature of 25° C.

Insulation resistance of 25,000 megohms or greater, measured at or referred to temperature of 25° C. Insulation resistance at 85° C., 500 megohms or greater.

Very high self-resonant frequency, due to remarkably small length of unit.

Life test: 1000 hours at 1.25 times rated voltage in ambient temperature at 85° C.

Meets humidity resistance requirements of RMA (REC-118, section 2, paragraph 2.38) for paper tubulars.

Meets RMA heat resistance test at 85° C. (REC-118, section 2, paragraph 2.39).

In 400 VDC (.0005 to .003 mfd.) and 200 VDC (.005 and .01 mfd.)

Other capacitance and voltage ratings will be made available in near future.

*Trade-mark

CAPACITORS • VIBRATORS • TEST INSTRUMENTS

AEROVOX capacitors

for Radio-Electronic and Industrial Applications

AEROVOX CORPORATION, NEW BEDFORD, MASS., U. S. A. • Sales Offices in All Principal Cities

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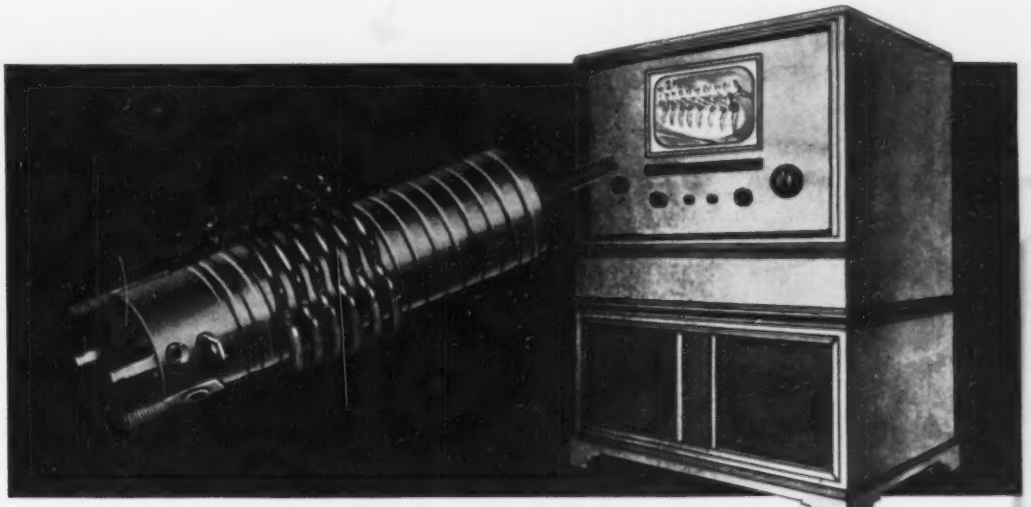
another C-D development . . .

a strong, lightweight, LOW-COST tubing for your electrical applications



Spiral Tubing—one of the many developments that have helped bring television into the mass market. Recently introduced by Continental-Diamond laboratories, it is ideal for electrical, radio, and television applications where a good dielectric tubing with high strength and lightweight is needed. It is available in a variety of sizes and grades to meet requirements for low moisture absorption, forming, riveting, drilling, tapping, etc.

It is another example of why it pays to see C-D first in your search for the right plastic. C-D Plastics provide *practical* combinations of mechanical, electrical, and chemical properties—structural strength, lightweight, moisture, heat and corrosion resistance. For fast delivery, or help with material selection problems, call your nearest C-D office, any time.

DE-5-49

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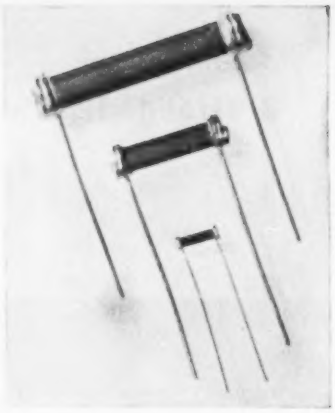
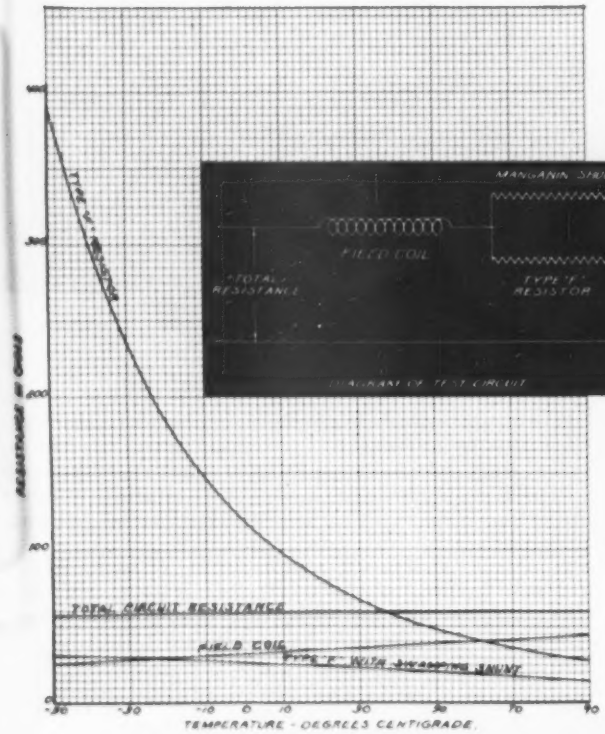
Continental-Diamond FIBRE COMPANY

Established 1895. . Manufacturers of Laminated Plastics since 1911—NEWARK 16 • DELAWARE

Where Temperature Changes affect Circuit Performance...

these Resistors provide a Solution





GLOBAR brand type F resistors can often provide the answer when extremes of temperature present an engineering problem. A typical example is shown by the curves plotted here. In this important control system, a GLOBAR type F resistor is used to compensate for resistance changes due to temperature variations in coils such as generator and motor fields, measuring and control circuits.

The pronounced negative resistance—temperature characteristics of GLOBAR type F resistors makes them particularly useful for stabilizing circuits having a positive temperature coefficient of resistance.

GLOBAR type F resistors have no moving parts to wear out or get out of adjustment. They have a negative temperature coefficient ranging from 1% to 2.2% per degree Centigrade at 25°C., increasing with their resistivity, and a low voltage coefficient.

● Bulletins contain useful engineering data on GLOBAR type F resistors. Copies will be supplied immediately upon request. Write Dept. V-60, The Carborundum Company, GLOBAR Division, Niagara Falls, New York.

GLOBAR Ceramic Resistors

BY CARBORUNDUM

TRADE MARK

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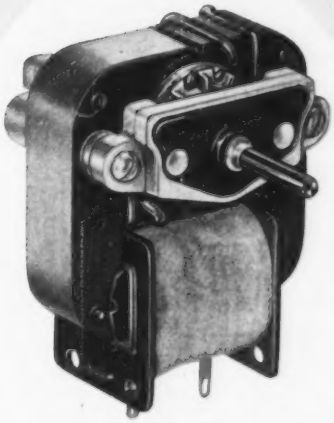
RAYTHEON

Fractional hp

MOTORS

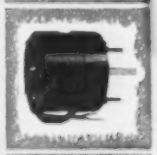
concentrated power

"Count on Raytheon to run it." That's what design engineers are saying. They're the men who appreciate the Creative Craftsmanship that goes into Raytheon fractional hp motors. Concentrated power in a small package—dependable performance at the shaft—those are the Key words in Raytheon design and engineering. When you want to *run* things, FANS, BLOWERS, HEATING EQUIPMENT, appliances or what have you—count on Raytheon motors to do the job. Call on your Raytheon motor representative for consultation on your specific application.

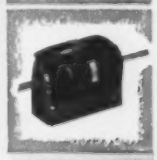


Type 230 Shaded 2-Pole Motor. For continuous duty without fan cooling. 1/200 to 1/50 hp at 3200 rpm. Flat Speed Torque Curve and High Starting and Pull Up Torque are characteristic of all Type 230 Raytheon motors. Efficiency is almost double the value ordinarily obtained in shaded two-pole motors of this type. Write for Data Bulletin 1000.

RAYTHEON TYPE 350 SHADED 2-POLE, 3000 rpm MOTOR.



RAYTHEON TYPE 330-S 4-POLE, 1/10 to 1/50 hp, 1550 rpm MOTOR.



RAYTHEON TYPE 470 SHADED 6-POLE, 1050 rpm INDUCTION MOTOR.

RUSSELL ELECTRIC COMPANY

MOTOR DIVISION OF RAYTHEON MANUFACTURING CO.

4501 So. Western Boulevard Dept. F-24 Chicago 9, Illinois

Why is "dag" Colloidal Graphite best for CRT Exterior Wall Coating?

It's cheaper
...Has better adhesion
...Requires no baking
...Resists scratching

BLEEDS STATIC FROM CABINETS TOO!

Static charges built up in TV sets—particularly where metal CRT's are used—can be successfully bled off by coating the inside of cabinets with "dag" Dispersion #194. This reduces picture interference and also precludes shock. Easy to apply by spraying or brushing.

"dag" Dispersion #194 is a lacquer-base dispersion of microscopically small graphite particles. It is easily applied to CRT surfaces by spraying, and dries very rapidly, enabling tubes to be handled in 2 or 3 minutes. Maximum adhesion is obtained by drying at room temperature for 24 hours, or by forced infra-red drying for ½ hour.

"dag" Dispersion #194 forms a smooth, uniform, conductive black coating on any type glass. Its adhesive properties are so good that it will resist scratching by a thumb nail or soaking in water.

Prominent CRT manufacturers have found **"dag"** colloidal graphite dispersions satisfactory and usually cheaper for wall coatings . . . for other electronics work, too. Let Acheson Colloids engineers show YOU how these versatile dispersions can solve many and varied electronics problems. Send the coupon NOW for more information.

ACHESON COLLOIDS CORPORATION
Port Huron, Michigan

Send me more information on:

_____ **"dag"** Dispersion #194 for Exterior Wall Coating
_____ **"dag"** Colloidal Graphite in Electronics

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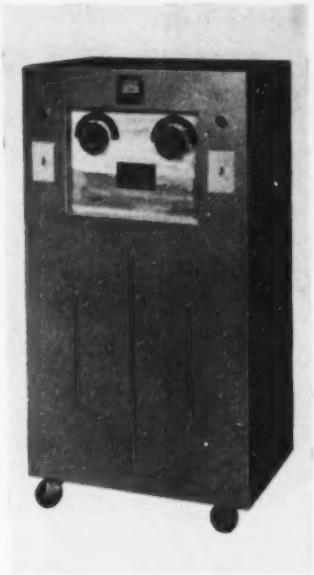
ACHESON COLLOIDS CORPORATION
Port Huron, Michigan

dag COLLOIDS

TRANSFORMERS AT WORK—KENYON

Heat Sealing Generator

KABAR MANUFACTURING CORP., 1907 White Plains Road, New York 60, N. Y. The Kabar Model No. 2500 High Frequency Generator is a versatile unit for heat sealing vinyl plastic fabrics. Indicative of the high quality of design are the KENYON Transformers used extensively.



The No. 2500 has a power supply of 220 volts, 60 cycles, single phase, output of 3 kw, output frequency of 27.12 megacycles and power consumption of 5.5 kw. Size of the compact unit is 50" x 26" x 18". Weighs approximately 400 lbs. Sealing cycle is automatically controlled.

The Kabar No. 2500 is but one of many high quality applications that call upon KENYON engineering ability and know-how for transformers that are built for rugged use. Whether it be standard KENYON "T" Line or "specials" custom-built to your requirements, you are always assured of quality, dependability and sound construction.

For over 20 years, leading manufacturers and engineers in all fields specify KENYON Transformers for many industrial, communication, sound and electronic applications. KABAR, too, specifies KENYON for high quality, economy transformers!

(Advertising)

Here's the "Q" in Transformers

It's Kenyon Quality

Custom-built to your Specifications

Kenyon one of the oldest names in transformers, offers you high quality specification transformers custom-built to your requirements — *practically at catalog prices!* For over 20 years the KENYON "K" has been a sign of skillful engineering, progressive design and sound construction.

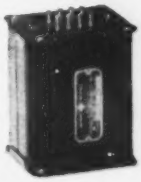
Kenyon "Specials" Are Designed For:

JAN APPLICATIONS	AUTOMATIC CONTROLS
BROADCAST	AUDIO AMPLIFIERS
INDUSTRIAL MACHINERY	EXPERIMENTAL LABORATORIES
RADAR	ATOMIC ENERGY EQUIPMENT

Among many others

Consult our engineering staff on any of your "special" problems at no obligation to you. Call or write now for our representative.

Kenyon "T's"— famous line of high quality, uniform transformers are ready for immediate delivery from stock. Our standard line can save you much time and expense. For a complete story about specific ratings on all transformers, send for your copy of the latest KENYON Catalog edition now!



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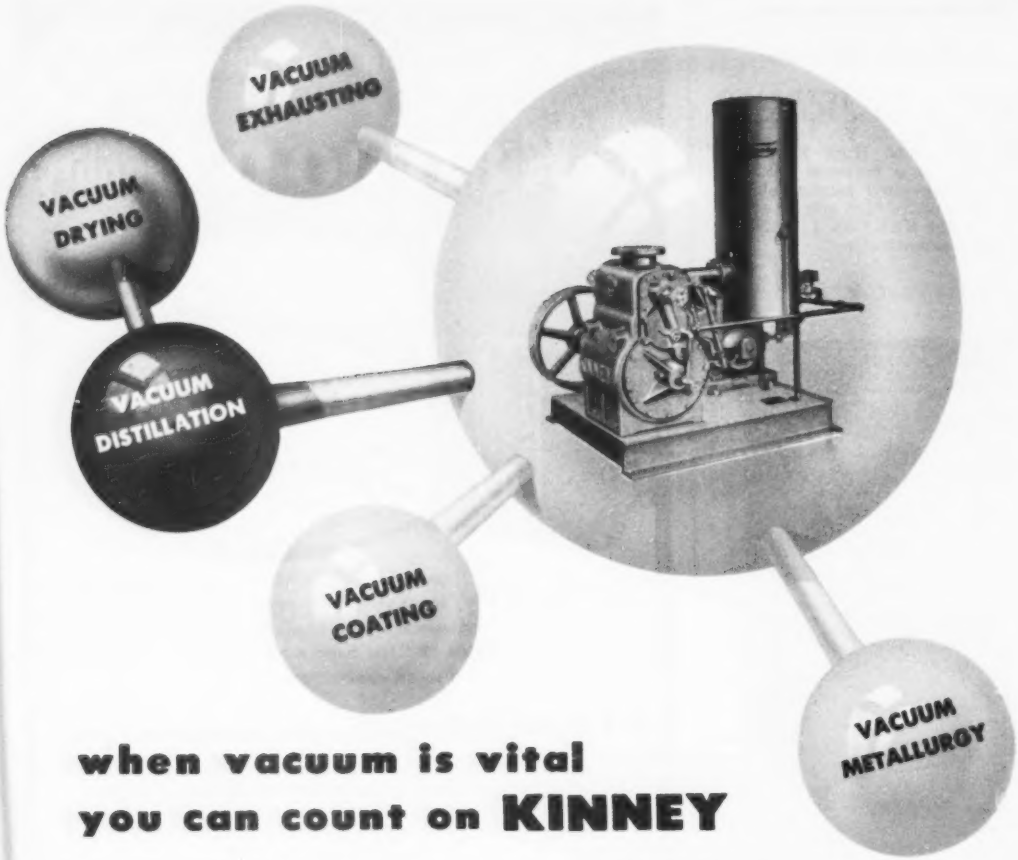
We need "special" transformers —
☐ Please have your representative call.



when vacuum is vital you can count on KINNEY

Kinney High Vacuum Pumps are at work in all phases of low pressure processing — in the production of television tubes, titanium, penicillin, electrical condensers, coated camera lenses, dehydrated foods, and scores of other products. Their dependability and high pumping speed have helped bring vacuum out of the laboratory and onto the production line. Kinney Pumps are establishing important records both for length of service and economy of operation. They are virtually a "production must" whenever processes require fast pump down to low absolute pressures.

Performance is the big reason why Kinney Pumps are so often specified "when vacuum is vital". Perhaps they can help speed YOUR processes or improve YOUR products. Write for Bulletin V-45, describing the complete line of Single Stage and Compound Vacuum Pumps. Kinney Manufacturing Company, 3565 Washington St., Boston 30, Mass. Representatives in New York, Chicago, Cleveland, Houston, New Orleans, Philadelphia, Los Angeles, San Francisco, Seattle.

Foreign Representatives: General Engineering Co. (Radcliffe) Ltd., Station Works, Bury Road, Radcliffe, Lancashire, England . . . Horrocks, Roxburgh Pty., Ltd., Melbourne, C. I. Australia . . . W. S. Thomas & Taylor Pty., Ltd., Johannesburg, Union of South Africa . . . Novelectric, Ltd., Zurich, Switzerland.

Making old things better
Making new things possible

KINNEY Vacuum Pumps

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SHOOT TROUBLE *on the line...* REDUCE COSTLY SHUTDOWNS!

INDUSTRIAL OSCILLOSCOPE—For tracing circuit trouble in electronic-control equipment, this scope is fast, accurate, and dependable. Ideal for checking welding machines, high wave capacitor discharge panels, variable speed motor controls. Set it down anywhere—the case is insulated . . . carry it easily—weighs only 27 pounds . . . use it in many ways—tests both AC and DC.

- ☆ Tests make-and-break of relay circuits
- ★ Checks waveforms in Thyratron control
- ☆ Max. input voltage 550
- ☆ Sensitivity 0.15 volts dc/inch; 0.18 volts rms/inch.

IN WELDING OPERATIONS—USE IT TO

- ★ check "hard-starting" ignitrons
- ★ observe voltage shapes on tube elements in timing sequence circuits
- ★ check instantaneous regulation on high current welder supply line
- ★ set "full heat limit adjustment"
- ★ check relays for bounce and high resistance contactors
- ★ check on- and off- time in seam welders
- ★ check behavior of peaking transformers
- ★ check high frequency interference switch transients caused by other equipment

INDUSTRIAL TUBE ANALYZER—Which tubes are bad? Don't guess—check them quickly, easily with this Analyzer that pays for itself in the cost of tubes you would normally scrap. Tests Thyratrons and Phanatrons with ratings up to 100 amperes peak current. Can be operated by non-technical personnel after brief instruction. Backs up the G-E Industrial Oscilloscope to boost your maintenance efficiency, cut your costs.

GET THIS CATALOG — IT'S FREE!

Contains specifications and price information on instruments shown here as well as other items of G-E electronic test equipment. Write: *General Electric Company, Section 460, Electronics Park, Syracuse, New York.*

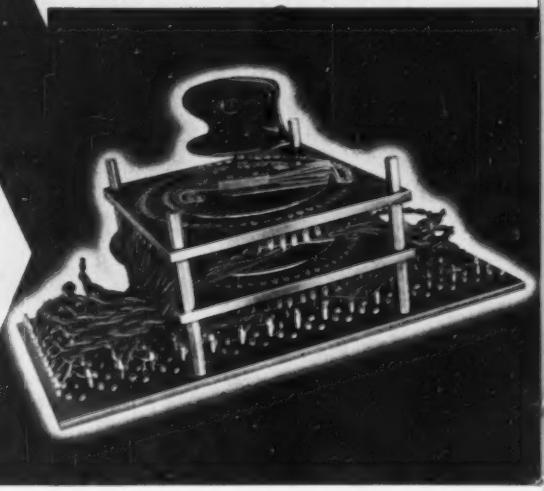
GENERAL ELECTRIC

PRECISION *electronic* SPECIALTIES

HIGH-STABILITY PRECISION RESISTORS

Guaranteed tolerances from 0.1% to 0.02% and stabilities as low as 0.003%.

It is one thing to make an accurate resistor, but quite another to guarantee the stability as required in computer circuits, tuning circuits, precision voltage dividers, radar range units, guided missiles and other critical uses. Not only are Shallcross Akra-Ohm resistor types 116, 196, and 193 outstanding in these respects, but they can likewise be furnished in matched pairs and sets to your tolerance and with a guaranteed stability as low as 0.003%.



MULTI-POSITION SELECTOR SWITCHES

Up to 120 contacts

As long-time specialists in custom-built rotary selector switches, Shallcross offers an extremely broad line of standard and special adaptations at attractive prices. Standard designs include up to 120 contacts per deck in shorting and non-shorting types and as many decks as may be required. Ask for Bulletin L13 and Specification Sheet 6.

CUSTOM-BUILT SPECIALTIES

Today's complex circuits frequently call for the design, development, and production of highly specialized components, sub-assemblies, or instruments which usually fall outside the realm of standard production. Backed by a staff of electronic, electrical, instrument, mechanical, and chemical engineers and fully equipped for both research and development, Shallcross is well organized to handle such assignments. Recent developments for leading manufacturers, public utilities, and military agencies have included:

Potted Wheatstone bridge networks • High-voltage measuring equipment Potted and thermally controlled R-C networks • Precise decades and networks for computer devices • Hermetically-sealed chokes • Calibrating instruments for strain gauge bridges High resistance standards • Critical coil assemblies

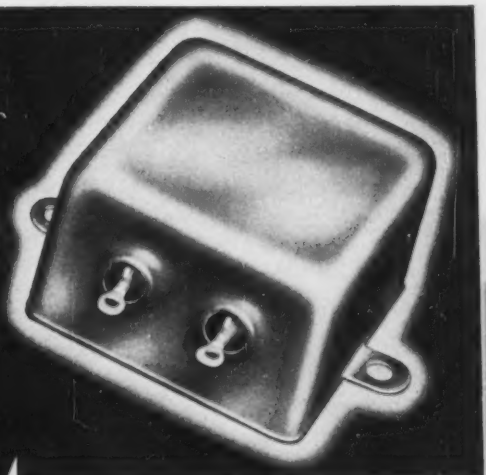
SHALLCROSS MANUFACTURING

BY SHALLCROSS

HERMETICALLY-SEALED NETWORKS

Resistance • Capacitance
Bridge • Inductance

To satisfy the exacting requirements of electronic computers, delay lines, tuning circuits, phase shifters, and other devices, Shallcross is fully equipped to design and produce potted networks to meet many critical electrical specifications and space requirements. The unit shown is a hermetically-sealed potted bridge network designed to control a potential of 100 volts to within ±0.1 volt.



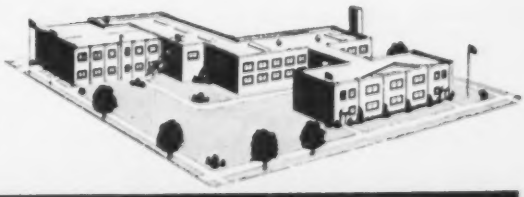
HIGH-RANGE KILOVOLTMETER MULTIPLIERS

and Voltage Dividers

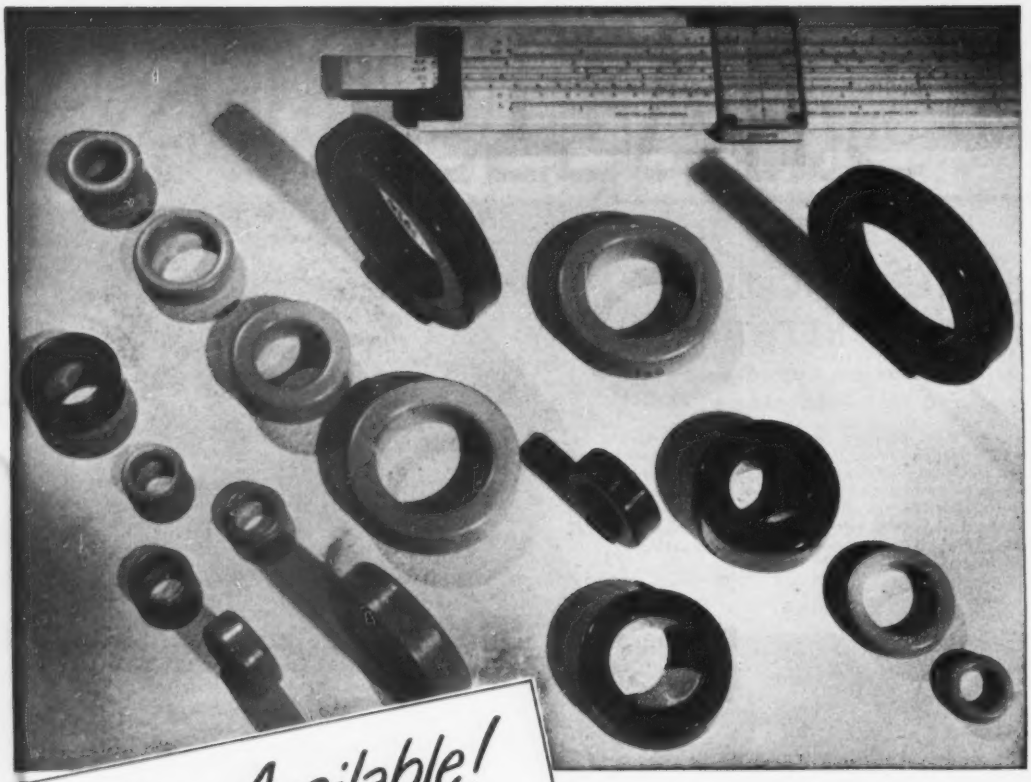
Whether for direct high-voltage measurements or for use as standards in determining the exact voltage of a portion of a high-voltage supply, Shallcross Kilovoltmeter Multipliers combine close accuracy with safety and dependability. The No. 791 Kilovoltmeter Multiplier illustrated here provides a ready means of determining a-c and d-c potentials up to 40,000 volts with outstanding accuracy. Other Shallcross types are available. For details, see Bulletin F.

HI-MEG HI-VOLTAGE RESISTORS

Special resistance elements hermetically-sealed in ceramic tubes with ferrule type terminals. With composition elements the standard tolerance is 10% and the temperature coefficient is 0.04% per degree C. Tolerances as close as 2% are available. With special wire-wound resistance elements, accuracies of 0.05% are easily obtained. A standard temperature coefficient of 0.002% per degree C holds over a wide temperature range. Three standard sizes offer resistance values from 1000 ohms to over 100 megohms. Write for Bulletin F



COMPANY Dept. E-60 **Collingdale, Pennsylvania**



Now Available!
MOLYBDENUM PERMALLOY POWDER CORES*

HIGH Q TOROIDS for use in Loading Coils, Filters, Broadband Carrier Systems and Networks—for frequencies up to 200 K C

COMPLETE LINE OF CORES TO MEET YOUR NEEDS

★ **Furnished in four standard permeabilities—125, 60, 26 and 14.**

★ **Available in a wide range of sizes to obtain nominal inductances as high as 281 mh/1000 turns.**

★ **These toroidal cores are given various types of enamel and varnish finishes, some of which permit winding with heavy Formex insulated wire without supplementary insulation over the core.**

For high Q in a small volume, characterized by low eddy current and hysteresis losses, ARNOLD Moly Permalloy Powder Toroidal Cores are commercially available to meet high standards of physical and electrical requirements. They provide constant permeability over a wide range of flux density. The 125 Mu cores are recommended for use up to 15 kc, 60 Mu at 10 to 50 kc, 26 Mu at 30 to 75 kc, and 14 Mu at 50 to 200 kc. Many of these cores may be furnished stabilized to provide constant permeability (±0.1%) over a specific temperature range.

* *Manufactured under licensing arrangements with Western Electric Company.*

AAD 2950

THE ARNOLD ENGINEERING COMPANY

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RHEOSTATS RESISTORS TAP SWITCHES

Here's Why You Get

UNFAILING DEPENDABILITY with OHMITE RHEOSTATS

Years of field experience emphasize the underlying soundness of Ohmite rheostat design. These rheostats are constructed entirely of ceramic and metal—contain nothing to char, burn, shrink, or deteriorate. Ceramic parts insulate the shaft and mounting. The resistance winding is permanently locked in place by vitreous enamel. Every turn is contacted by the smoothly gliding metal-graphite brush, ensuring smooth, gradual, close control.

OHMITE MANUFACTURING CO.
4816 Flournoy St.
Chicago 44, Ill.

UNIFORM CONTACT PRESSURE
Spring steel contact arm forms a long spring which assures uniform contact pressure at all times.
UNIFORM SLIP-RING PRESSURE
Compression spring maintains uniform pressure and electrical contact between slip ring and center lead. Pressure here is independent of that at the contact brush.
METAL-GRAPHITE BRUSH
Assures perfect contact with negligible wear on the wire.
SHAFT INSULATED FROM LIVE PARTS
High-strength ceramic hub insulates shaft and bushing from all live parts.
STOP PREVENTS STRAIN ON CONTACT ARM
Stop, keyed to the shaft, limits the rotation of the arm. No torsional strain is imposed on the arm in stopping.
THREE TERMINALS
Ohmite rheostats are provided with three terminals, so they can be used as potentiometers (voltage dividers), or to permit alternate rheostat connections.
WEAR-RESISTANT BEARING
Brass bushing for the steel shaft provides a wear-resistant, wobble-free bearing.
LOCKED-IN WINDING
Special alloy resistance wire is wound over a porcelain core. Each turn is firmly locked in vitreous enamel.
VITREOUS ENAMEL BOND
Vitreous enamel bonds the ceramic core and base together into one integral unit.
BEND-UP LOCK WASHER
Bend-up lock washer provides positive assurance against loosening of the assembly nut.

Be Right with

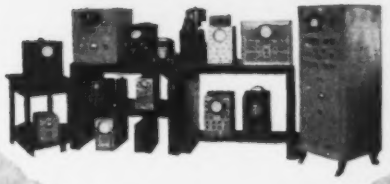
OHMITE

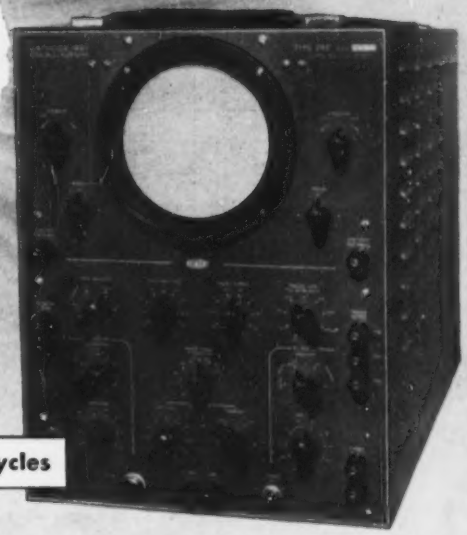
Write on Company Letterhead for Catalog and Engineering Manual #40.

RHEOSTATS • RESISTORS • TAP SWITCHES

25th Anniversary
1916-1941

DU MONT *Oscillography..*





. . . the outstanding heritage of another great performer

DEFINING THE OSCILLOGRAPHIC SPECTRUM **from 10 cps. to 15 megacycles**

THE NEW DU MONT TYPE 294 CATHODE-RAY OSCILLOGRAPH

The Type 294 is an extremely versatile cathode-ray oscillograph combining high-voltage operation with precise high-frequency circuit design, extending its general-purpose utility to meet the specialized needs of high-speed transient study.

Stable operation of the high-gain, wide-band amplifier of the Y axis over the entire frequency range from 10 cps. to 15 megacycles includes the performance of a signal-delay line built into the Y-axis circuit to insure full display of short-duration pulses. An input pulse rise time of 0.01 μs. will be reproduced with a rise time not exceeding 0.03 μs.

Available undistorted deflection of both symmetrical signals and unidirectional pulses of either positive or negative polarity exceeds the usable vertical scan of the cathode-ray tube. A built-in high-voltage unit supplies 12 kv. accelerating potential to the Du Mont Type 5XP cathode-ray tube; rear-panel selection of a lower potential may be made for increased sensitivity and deflection.

A flexible sweep circuit provides continuously variable driven and recurrent sweeps with sweep calibration being provided by internal timing markers applied through the Z-axis amplifier.

• • •

Permanent records of phenomena studied with the Type 294 may be made with either the Du Mont Type 271-A or 314-A Oscillograph-record Camera.

GENERAL SPECIFICATIONS

Cathode-ray Tube . . . . . Du Mont Type 5XP
Accelerating potential . . . . . 12,000 volts
. . . . . 7,000 volts

Y-axis Amplifier
Frequency response
10 cps. to 15 megacycles
Sensitivity . . . . . 0.15 rms volt/in. at 7 kv.
. . . . 0.20 rms volt/in. at 12 kv.
Rise time . . . . 0.03 μs. from 10% to 90%

Signal Delay . . . . . 0.25 μs.

X-axis Amplifier
Frequency response . . . . . 2 cps. to 700 kc.
Sensitivity . . . . . 0.4 rms volt/in. at 7 kv.
. . . . . 0.5 rms volt/in. at 12 kv.
Rise time . . . . . 0.5 μs. from 10% to 90%

Driven Sweep Range . . . . . 0.1 sec. to 2 μs.

Recurrent Sweep Range . . 10 cps. to 150 kc.

Z-axis Amplifier
Polarity selection—3 volts peak to blank trace of normal intensity.

Timing-Marker Intervals
100 μs., 10 μs., 1 μs.

Trigger Generator
Repetition rate . . . . . 200 to 3600 p.p.s.
Output amplitude . . . . . 50 volts peak
Output polarity . . . . positive or negative

Physical Specifications
Indicator Unit
24½" d.—15¾" h.—12¾" w.—62 lbs.
Power Supply
19¾" d.—15⅜" h.—12⅜" w.—100 lbs.

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ALLEN B. DUMONT LABORATORIES, INC., INSTRUMENT DIVISION, 1000 MAIN AVENUE, CLIFTON, NEW JERSEY

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Making available a wider choice of

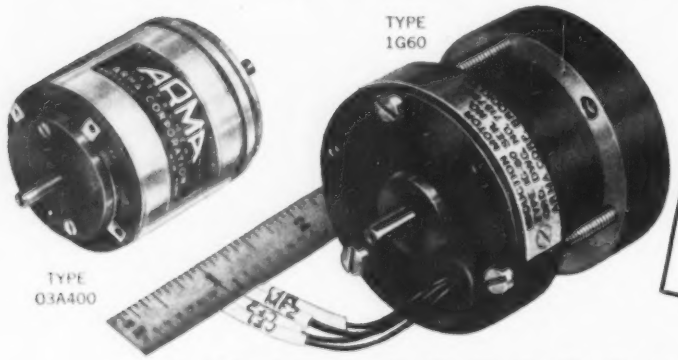
ARMA Induction Motors

Designed specifically for high performance servo applications

TYPICAL SPECIFICATIONS

	TYPE	DWG. No.	FREQ.	FIELD VOLTAGES			(Min.) NO LOAD SPEED R.P.M.	MAX. WATTS OUTPUT at R.P.M.	STALLED TORQUE (Min.) Oz. in.	ROTOR INERTIA Oz. in.^{2}	WEIGHT lbs.
				PHASE	MAIN	CONTROL					
New	03A60	715758-1	60	2	24	24	1600	0.55 at 875	1.3	0.040	0.25
New	03B60	715758-2	60	2	24	24	3000	1.0 at 2000	1.0	0.040	0.25
	1A60	213377-2	60	2	40	40	3100	1.5 at 1750	1.7	0.030	0.8
	1B60	213251-1	60	2	115	115	3000	2.4 at 2000	3.0	0.25	1.4
	1D60	213251-2	60	2	115	115	3000	6.5 at 2000	8.0	0.25	1.4
New	1F60	64913	60	3	115		3200	13.0 at 2000	16.	0.048	1.5
New	1G60	65016 (715759)	60	2	115	40	1500	1.0 at 750	3.0	0.051	0.56
	5A	213079-1	60	2	75	90	3000	6.3 at 1800	8.0	0.32	4.0
	5C	213261-1	60	2	90	75	3000	7.5 at 2000	8.0	5.51	4.3
	6	213069-1	60	2	115	90	3000	18.0 at 2000	16.5	1.38	9.8
New	03A400	715640-1	400	2	24	24	10,000	1.8 at 6000	0.7	0.036	0.25

FEATURES Low Bearing Friction • Rapid Response to Applied Voltage • Symmetrical Rotor Design • Quiet Operation • High Mechanical Accuracy • Double Ended Shafts.



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QUALITY ARMA INSTRUMENT PRECISION

New BRUSH Dual Channel DC Amplifier simplifies current-voltage studies

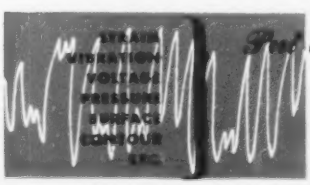
To measure and record two phenomena simultaneously, Brush introduces the new Model BL-928 Dual Channel Direct Coupled Amplifier for use with the Model BL-202 Dual Channel Magnetic Oscillograph. These Brush instruments, shown above, are being used in the test laboratory of Hertner Electric Company, Cleveland, Ohio to study the characteristics of motor-generators. In this particular test, they are recording generator voltage and field current time-curves for plotting a saturation curve and studying build-up of voltage. This requires only a few minutes . . . compared to the hours needed for conventional plotting methods.

These Brush dual-channel instruments can simplify the study of many other variables such as battery characteristics, photo cell outputs, line voltage and current values and electric phenomena having amplitudes of 40 millivolts or more and frequency components from zero to 100 cycles per second. Write for Form 732 which gives further details.

THE *Brush* DEVELOPMENT COMPANY

3405 Perkins Avenue, Cleveland 14, Ohio, U. S. A.

Canadian Representatives: A. C. Wickman (Canada) Ltd., P. O. Box 9 Station N, Toronto 14, Ontario



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Non-Emitting Grids

Input-Output Shielding

Low-Inductance Leads

Eimac 4-125A tetrodes fill more key sockets than any other 125-watt tetrode.

The Eimac 4-125A is the heart of modern radio communication systems. Its dependability-of-performance has been proved over years of service in many thousand transmitters. It will be to your advantage to consider carefully the economy and circuit simplification the Eimac 4-125A offers.

As an example of Eimac 4-125A performance, two tubes in typical class-C telegraphy or FM telephony operation with less than 5 watts of grid-driving power will handle 1000 watts input; or, two 4-125A's in high-level modulated service will handle 750 watts input.

Take advantage of the engineering experience of America's foremost tetrode manufacturer . . . Eimac. Write for complete data on the 4-125A and other equally famous Eimac tetrodes.

EITEL-McCULLOUGH, INC.
San Bruno, California

Export Agents: Frazar & Hanson, 301 Clay St., San Francisco, California

The 4-125A is another Eimac contribution to electronic progress.

they may look alike, *but:* there is only one C-D

THE STANDARD IN THE FIELD OF HIGH POWER OSCILLATORS

type 50 series

C-D HIGH POWER MICA TRANSMITTER CAPACITORS

Typical of the many C-D firsts are the type 50 mica capacitors. Only C-D micas can point to a record of dependable service of over forty years. Here's why:

Series mica stack—C-D first to use and patent this construction. Affords uniform voltage gradient!

India-ruby mica—Sheets *individually* tested for uniform thickness and dielectric strength!

Special exclusive high melting point low loss filler—Reduces stray field losses; protects against humidity!

Vacuum impregnated assembly—Assures high insulation resistance; low losses; eliminates air voids!

High pressure maintained on stacks—Results in high Q; good capacity stability.

Cast-aluminum end caps—Low-resistance, wide-path, positive-contact terminals for series, parallel or series-parallel connection. Speedy, space-conserving installations!

Every unit tested under long, continuous overload—Assures maximum reliable service.

Type 50 capacitors are available in all commercial capacity and voltage ratings. For complete description of these and Faradon type transmitter capacitors, write for catalog. CORNELL-DUBILIER ELECTRIC CORPORATION, Dept. K-6-0, South Plainfield, New Jersey. Other plants in New Bedford, Brookline and Worcester, Mass.; Providence, R. I.; Indianapolis, Ind., and subsidiary, The Radiart Corp., Cleveland, Ohio.

C-D Best by Field Test!

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1910 1950

SUBSIDIARY

Here's Why...

you now get

Quick Delivery

on these

Top Quality

One of the assembly lines in our Relay Department

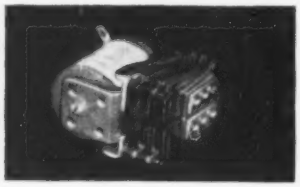
AUTOMATIC ELECTRIC

RELAYS **SWITCHES**

This special—*and separate*—department has but one function . . . to process *your* orders promptly and accurately. Here, stocks of all standard parts are maintained, ready for expert assembly in accordance with your specific requirements. "Engineering Samples" are shipped within 10 to 14 days after receipt of order (for hermetically sealed relays, allow 10 days more). Quantity shipments can start within 30 to 60 days on schedules to meet your requirements. With high-geared volume production, thousands of these superior components are being delivered quickly.

WHEREVER DEPENDABILITY COMES FIRST:—*The men who know insist upon Automatic Electric Relays and Switches for top quality. Here are a few examples:*

CLASS "B" RELAYS—For requirements up to 26 terminals—greater sensitivity, contact pressure, compactness, versatility. And here's dependable long life even under extremely high speed operation. Hermetically sealed, where desired, to maintain highest performance standards.



CLASS "S" RELAYS—For aircraft and other applications requiring small size, light weight, and hermetic sealing, if desired. Astonishing power in small space. Unaffected by extreme vibration, temperature changes, high humidity. Supplied with coils up to 10,000 ohms or more.

TYPE 45 ROTARY SWITCH—Up to 10 or more bank levels, adaptable to 25- or 50-point operation. Speed to 70 steps a second. Simpler . . . only one field adjustment. For d-c service or completely self-contained for a-c service to suit a wide variety of control applications.

For help on your control problems, call one of our field engineers, or write for literature. Address AUTOMATIC ELECTRIC SALES CORPORATION, Chicago 7, Illinois. In Canada: Automatic Electric (Canada) Ltd., Toronto.

RELAYS **SWITCHES**

AUTOMATIC ELECTRIC

CHICAGO

HERE'S YOUR ANSWER

to the problem of HIGH INSULATION PERFORMANCE at LOW cost:

IRVINGTON
Style **OW**
VARNISHED FIBERGLAS*

Look to Irvington
for Insulation Leadership

*T.M. Reg. Owens-Corning Fiberglas Corp.

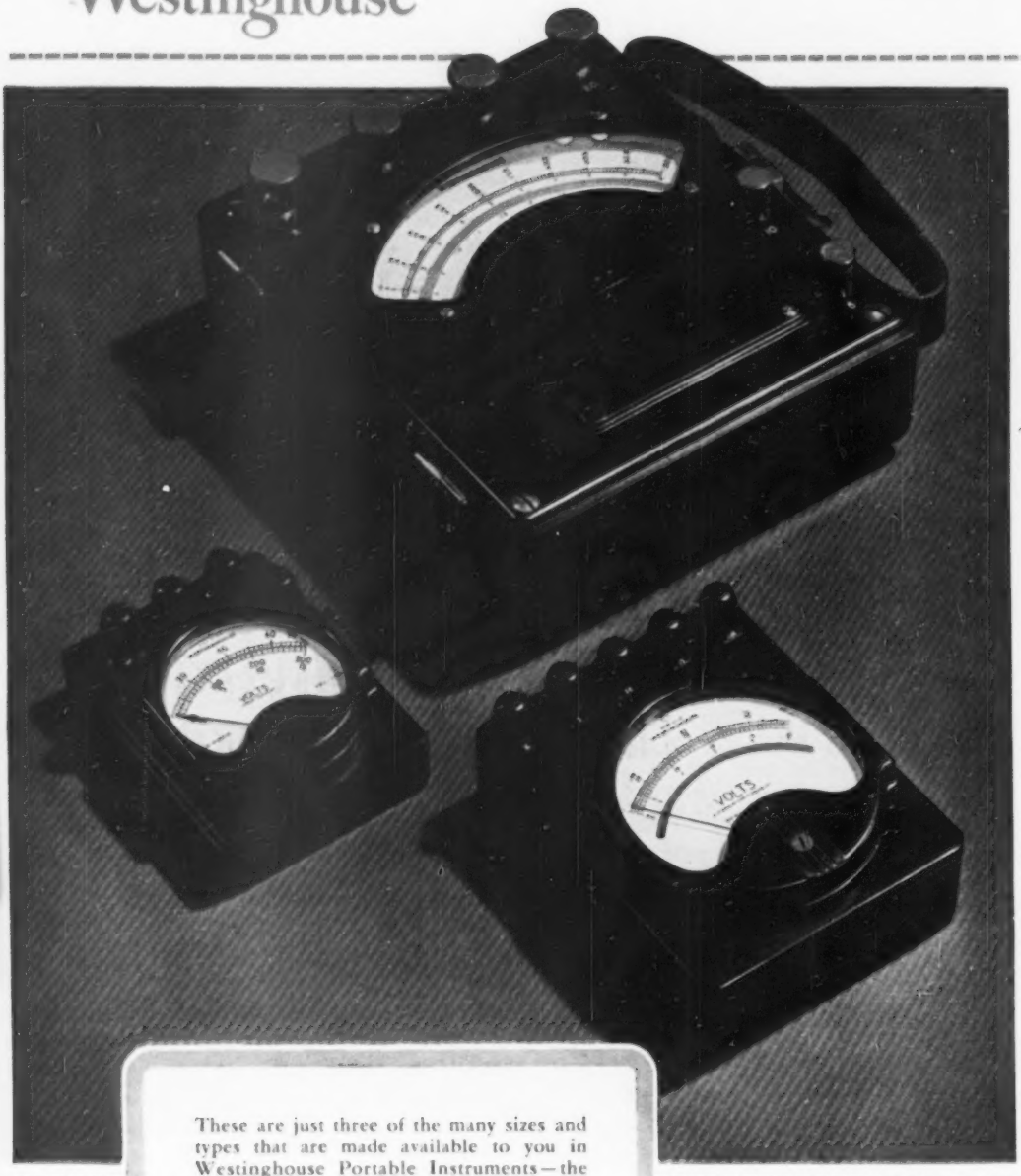
Look to Irvington for the right combination to boost performance, improve quality, cut cost . . . of *your* products! Latest in Irvington's line of leadership is Style OW Varnished Fiberglas Class B insulation, which has *proved* its value in core wrappings, field coils, punchings, similar tough spots.

Irvington Style OW Varnished Fiberglas utilizes a new weaving principle that permits the glass fabric to carry more insulating varnish. Black or yellow, 36″ wide, .007″ to .012″ thick, 25 or 50 yds. long, this new insulation may provide the answer to your design problem. Write today for test reports, further details, samples.

IRVINGTON
VARNISH and INSULATOR COMPANY
Irvington 11, New Jersey

YOU CAN BE **SURE**.. IF IT'S

Westinghouse



These are just three of the many sizes and types that are made available to you in Westinghouse Portable Instruments—the most complete matched line in the Industry. For all your portable instrument requirements, refer to Westinghouse Catalog Section 43-100—ask your nearest Westinghouse Representative.

Get more for your instrument dollar!

1. The most complete matched line

in the industry . . . for every portable requirement.

2. Shipments in 10 days!

Shipments can be made for practically every requirement for portable electrical measuring instruments within 10 days of receipt of order at factory.

3. Assured A.S.A. standards.

Every Westinghouse Portable Instrument is designed and built to meet the rigid standards of the American Standards Association.

AND . . . you get the famous Westinghouse *controlled quality* that assures you of permanently white dials, springs that remain constant for life, magnets that remain stable, low-friction pivots, high overload capacity and uniform scale distribution.

Westinghouse Instrument Specialists are available at all times to assist you with *your* electrical measuring problems. Their nationwide experience enables them to solve instrument application problems of *all* types. Phone, write or wire your nearest representative. For the complete story on portable instruments, ask for C. S. 43-100. Westinghouse Electric Corporation, 95 Orange Street, Newark, N. J.

J-40192

Specify Westinghouse *and be SURE of all three!*

Westinghouse

INSTRUMENTS

Watch Master

Frequency Standards

GUARANTEED
ACCURACY
1 part in 100,000
(.001%)

Type 212

TERMINATION
Front and Rear
CONSTRUCTION
Standard 8¾" x 19" Panel
HOUSING
8¾" x 19" x 8" Metal Cabinet
WEIGHT
25 pounds

Uses

Time bases, rate indicators, clock systems, chronographs, geo-physical prospecting, control devices and for running small synchronous motors.

Features

1. **Bimetallic, temperature-compensated fork, no heating or heat-up time is required.**
2. **Fork is hermetically sealed, no barometric effects on frequency.**
3. **Precision type, non-ageing, low coefficient resistors used where advantageous.**
4. **Non-linear negative feedback for constant amplitude control.**
5. **No multi-vibrators used.**
6. **Synchronous clock simplifies checking with time signal.**

Specifications

Accuracy—1 part in 100,000 (.001%).
Temperature coefficient—1 part in 1,000,000 per degree centigrade (or better).
Outputs—

1. **60 cycles, sine wave, 0-110 volts at 0 to 10 watts (adjustable).**
2. **120 cycle pulses, 30 volts negative.**
3. **240 cycle pulses, 30 volts positive and negative. Pulse duration, 100 micro-seconds.**

product of

AMERICAN TIME PRODUCTS INC.

580 Fifth Avenue New York 19, N. Y.

Operating under patents of the Western Electric Company

American Time Products, Inc.,
580 Fifth Ave., New York 19, N. Y.
Gentlemen:
Please send descriptive folder, No. 212

Name _____

Company _____

Address _____

City _____ State _____

In medieval times, a coat-of-arms had an importance that could not be overestimated. It was granted as a personal badge, signifying the attributes and accomplishments of its proprietor—and as such was respected thruout the civilized world. It had no duplicate.

In turn, the emblem imposed upon its owner a responsibility for maintaining an enviable reputation—a condition which stimulated general confidence in him.

Times have changed, but not all *things*. The sense of sanctity of an emblem is prevalent today as it was hundreds of years ago. That is why we take such pride in our trademark: NICHROME.

It is evidence of our accomplishment; our unique, personal badge — respected everywhere. Granted solely and wholly to us by the United States Patent Office over forty years ago, it symbolizes a series of superb electrical heat and corrosion-resistant alloys (developed and produced *only* by Driver-Harris Company) which today is serving industry all over the world.

Yes, there are other excellent heat and corrosion-resistant alloys, but *only one* NICHROME—the product of exclusive Driver-Harris knowledge and techniques.

We are well aware of our obligation to maintain its reputation, both here and abroad. In fact, such obligation is an inspiration to give of our best—now, tomorrow, and always.

FIFTIETH ANNIVERSARY

Nichrome* is manufactured only by

Driver-Harris Company

HARRISON, NEW JERSEY

BRANCHES: Chicago, Detroit, Cleveland, Los Angeles, San Francisco,

Manufactured and sold in Canada by

The B. GREENING WIRE COMPANY, LTD., Hamilton, Ontario, Canada

**T.M. Registered in United States Patent Office by Driver-Harris Company August, 1908*

No Other Porcelain Offers the Superior Advantages of

ZIRCON PORCELAIN

in Electrical, Technical and Mechanical Applications

The increasing number of uses for Zircon Porcelain in a long list of diverse applications focuses interest on the expanding potential of this material. Its excellent combination of properties is widely applied in the low-frequency power field, in high-frequency and ultra-high frequency equipment, and in special installations where effective resistance to thermal shock or high mechanical strength is required at both normal and elevated temperatures.

TAM has pioneered this and many other developments in which Zirconium compounds are used.

Characteristics of Zircon Porcelain

1 Formed by any conventional method.
2 Readily produced in uniform, high quality.
3 Long firing range.
4 One-fire process.
5 High abrasion resistance.
6 Strong mechanically.
7 Chemical resistance.
8 High thermal conductivity.
9 Thermal shock resistance.
10 Low electrical loss factor.
11 High electrical resistivity and dielectric strength at normal and elevated temperatures.
12 Raw material, of closely controlled properties, readily available from TAM.

TAM PRODUCTS
Registered U. S. Pat. Off.

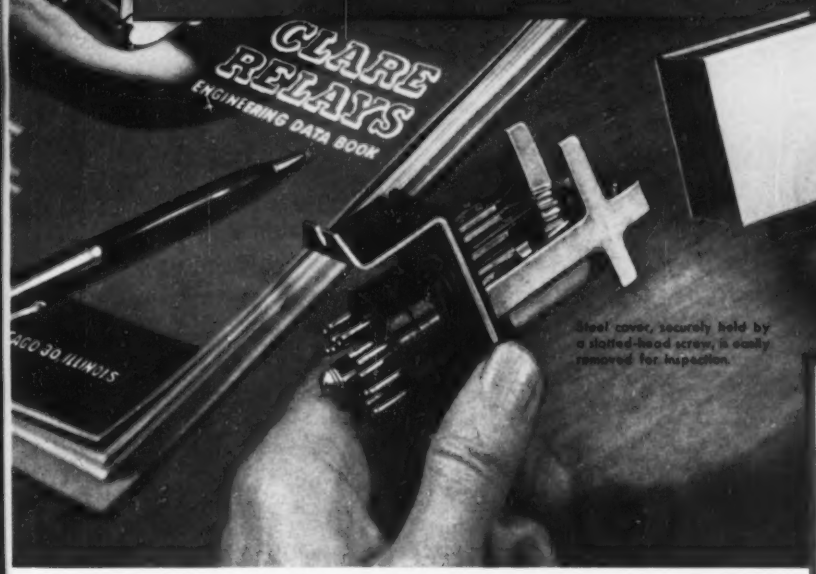
TAM is a registered trademark

TITANIUM ALLOY MFG. DIVISION
NATIONAL LEAD COMPANY
Executive and Sales Office: 111 BROADWAY, NEW YORK CITY · General Offices, Works, and Research Laboratories: NIAGARA FALLS, N. Y.

New Dust-Tight Plug-in Enclosure for

CLARE TYPE "J" TWIN CONTACT RELAY

To Meet Severe Operating Conditions



Steel cover, securely held by a slotted-head screw, is easily removed for inspection.

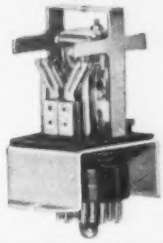
● This new CLARE dust-tight plug-in enclosure for the small Type "J" Relay offers designers a number of unusual features for installation on industrial equipment.

Entrance of dust is prevented by the steel cover and by use of a Neoprene gasket which is closely fitted at the factory to the relay terminals. The dust-tight cover is easily removed for inspection. Use of standard radio plug simplifies installation and cuts wiring costs. Base is secured to chassis to prevent plug from being jarred or accidentally pulled from its socket.

Exclusive design of the CLARE Type "J" Relay allows the twin contacts to operate independently of each other. One contact is sure to close, reducing contact failure to the practical limit. This relay combines all the best features of the conventional telephone-type relay with small size and light weight. It provides unusually high current-carrying capacity, large contact spring capacity, extreme sensitivity and high operating speed.

This new dust-tight enclosed relay is one of many outstanding CLARE contributions in the development of new and better relay components for industry. CLARE Sales Engineers are located in principal cities to consult with you on your relay problems. Call them direct or write: C. P. Clare & Co., 4719 West Sunnyside Avenue, Chicago 30, Illinois. Cable Address: CLARELAY. In Canada: Canadian Line Materials Ltd., Toronto 13.

Write for Bulletin No. 108



Neoprene gasket, closely fitted at factory to relay terminals, between base and cover, effectively occludes dust.

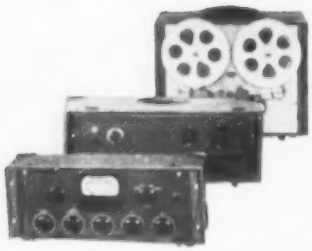
Plug is standard radio-type plug. Standard finishes are silver lustre lacquer for cover, cadmium for base. Retaining screws hold base securely to panel.

CLARE RELAYS

First in the Industrial Field

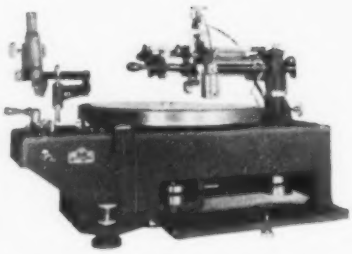
no matter **how** you **record**...

tape or **disc**



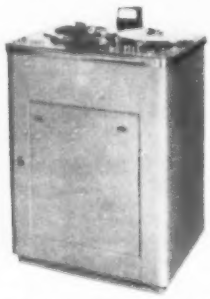
PRESTO portable tape recorder PT-900

Packs easily into two portable cases, but sets up into complete broadcast-quality machine. Three heads . . . erase, record, reproduce. Separate recording and monitoring amplifiers. Available in either 15" sec & 7½" sec or 7½" sec & 3¾" sec. Three microphone input.



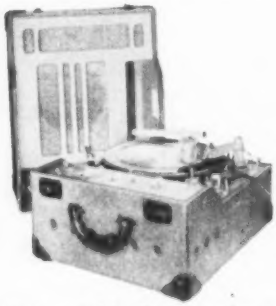
PRESTO precision disc recorder 8-D

Designed for extreme accuracy and ease of operation. Available in either rim drive (8-D) or gear drive (8-DG). Frequency response 50 to 10,000 cps. Heavy overhead cantilever cutting mechanism requires no contact with record. Double motor drive on 8-DG. 33⅓ and 78 rpm.



PRESTO console tape recorder SR-950

The finest studio type tape recorder available. Operation by push button control. Three motors, three heads. Frequency response: 30 to 15,000 cps at 15" sec. Signal to noise ratio more than 52 db at 1½% distortion. Cabinet designed for rapid maintenance.



PRESTO portable disc recorder K-10

Records and plays microgroove and standard records at 33⅓ rpm (45 rpm available at slight additional cost). Two interchangeable pickup arms. 12" turntable accommodates 13¼" disc. Detachable dynamic speaker, sturdy portable cases. Frequency response: 50-8000 cycles.

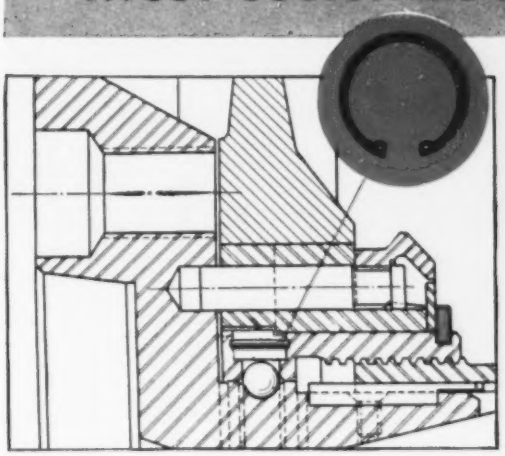
PRESTO equipment gives **BETTER** results

Well informed engineers read
THE PRESTO RECORDER
every month
Is your name on our free distribution list?

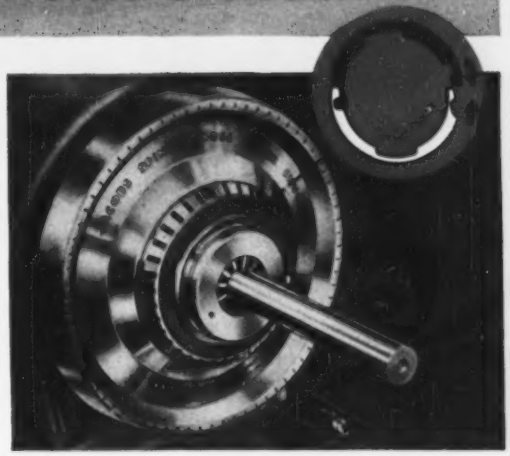
PRESTO RECORDING CORPORATION
Paramus, New Jersey

IN CANADA: Walter P. Downs, Ltd., Dominion Square Bldg., Montreal, Canada
OVERSEAS: M. Simons & Co., Inc., 25 Warren Street New York, N. Y.

2 Waldes Truarc Rings Save Space ...cut costs...Lock entire chuck



INTERNAL RING: Used instead of a shoulder screw, Truarc internal ring #5000-37 locks disc over ball loading hole. Saves 1/8 inch in overall diameter. Eliminates tapping. Withstands machine vibration and vibration from impact device within chuck. Used with Truarc pliers, it facilitates assembly and disassembly.



INTERLOCKING RING: Used instead of a locknut, Truarc interlocking ring #5107-343 locks handwheel assembly securely on impact sleeve of Jacobs chuck. Saves 7/32 inch in overall length. Eliminates tapping. Chuck's top speed: 5000 RPM; Truarc ring is dynamically balanced to withstand 50,000 RPM's. Services easily with a screwdriver.

2 Waldes Truarc Retaining Rings secure the entire mechanism of new spindle nose lathe chuck for Jacobs Mfg. Co., Hartford, Conn. Truarc gives Jacobs a finer, more compact product, and at lower cost than possible with any other fastening device.

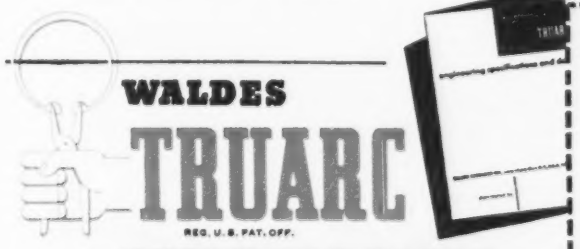
Wherever you use machined shoulders, nuts, bolts, snap rings, cotter pins, there's a Truarc Ring that does a better job of holding parts together.

Truarc Rings are precision engineered. Quick and easy to assemble, disassemble. Always circular to give a never-failing grip. They can be used over and over again.

Find out what Truarc Rings can do for you. Send your drawings to Waldes Truarc Engineers for individual attention, without obligation.

2 TRUARC RINGS GIVE 6 BIG ADVANTAGES

- Cut overall length 7/32 in.
- Cut overall diameter 1/8 in.
- Eliminate cost of tapping
- Withstand up to 50,000 RPM's, give a factor of assurance of 10
- Withstand machine vibration
- Facilitate assembly, disassembly



WALDES

TRUARC

REG. U. S. PAT. OFF.

RETAINING RINGS

WALDES KOHINOOR, INC., LONG ISLAND CITY 1, NEW YORK

WALDES TRUARC RETAINING RINGS ARE PROTECTED BY U. S. PATS. 2,362,940; 2,409,454; 2,416,002 AND OTHER PATS. PEND.

Waldes Kohinoor, Inc., 47-16 Austel Place E-062
Long Island City 1, N. Y.

Please send 28-page Data Book on Waldes Truarc Retaining Rings.

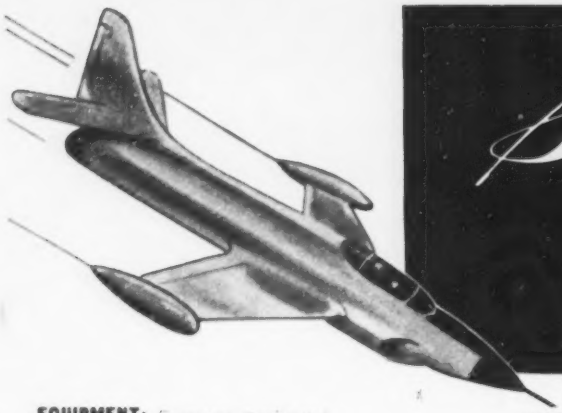
Name_____

Title_____

Company_____

Business Address_____

City_____ Zone_____ State_____ ★



Sorensen
ELECTRONIC EQUIPMENT FOR *AVIATION*

EQUIPMENT: Sorensen equipment (400 cycle line voltage regulators, Inverters, Regulated DC supplys, Frequency changers and Phase Adapters) are lightweight, designed for conformity to JAN specifications.

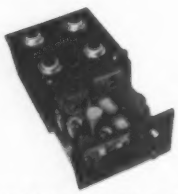
TEST EQUIPMENT AIDS: Sorensen's voltage regulating equipment (400 cycle Line Regulators, DC supplys or "Nobatrons") can facilitate the use of test equipment by providing regulated AC or DC power.

SORENSEN: offers the Aviation field three principal types of product:

COMPONENTS: Sorensen has a wide range of products which can be used to great advantage in aviation manufacturers' equipment. Chief among these are the 400 cycle variable auto transformers, the Saturable Core reactors and other power components. Equipment units can be designed to meet JAN specifications.

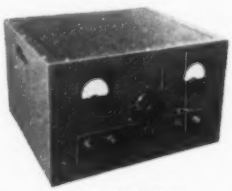
FOSTERITE: In airborne units, Sorensen seals its wound components against humidity by the Fosterite process, a method which adds little to weight or size, and is, therefore, ideal in aircraft electronic design.

TYPICAL SORENSEN AIRBORNE UNITS

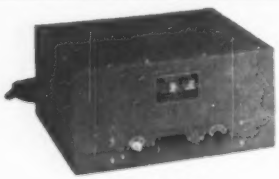


400 CYCLE REGULATOR
± 0.5% regulation; 400 cycles ± 10%; 5% distortion; 50 VA to 3 KVA capacities.

ELECTRONIC INVERTER
Inverters and Frequency changes under development. Specifications on request.

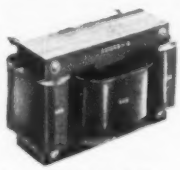


DC SUPPLY
0-325 VDC; 0-500 VDC; 300-1000 DC regulated ± 0.5%; 125, 300, 500 ma.



NOBATRON
6-12-28-48-125 VDC from 5-350 amperes; regulated ± 0.25%; 60 or 400 cycles input.

400 CYCLE AUTO TRANSFORMER
0-130 VA; 400 Cycles 5 and 15 amperes.



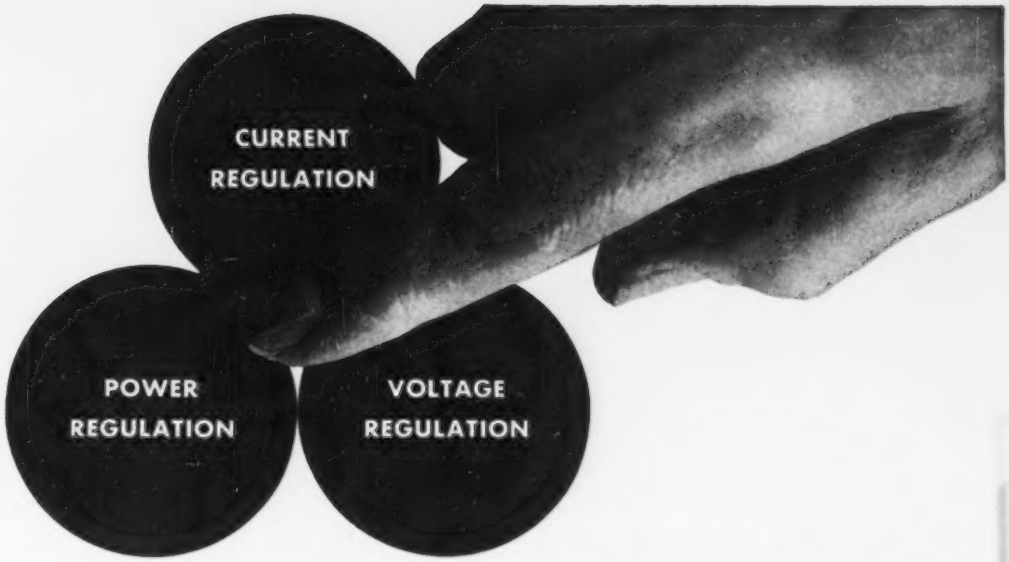
SATURABLE CORE REACTOR
For magnetic amplifier circuits. Request data book.

LITERATURE: The following literature is available on request: Catalog A 1049 (AC regulators); Catalog B 1049 (Nobatrons and DC supplys); Catalog C 1049 (wound components and fosterite); Saturable Core Reactor Technical Data sheets; "Aircraft" issue of "Currently."

controlled converted POWER

Sorensen and company, inc.
375 FAIRFIELD AVE. • STAMFORD, CONN.

MANUFACTURERS OF AC LINE REGULATORS, 60 AND 400 CYCLES, REGULATED DC POWER SOURCES, ELECTRONIC INVERTORS, VOLTAGE REFERENCE STANDARD; CUSTOM BUILT TRANSFORMERS; SATURABLE CORE REACTORS



can you put your Finger on the TROUBLE?

- If you can, a SORENSEN Electronically controlled, magnetic amplifier regulating circuit can solve it!

  Sorensen's *new line* of Electronic AC Voltage Regulators is the *most accurate* and *most economical* line of Electronic Voltage Regulators on the market today. Standard specifications offer Accuracy to within ±0.1% and Distortion as low as 2%. Load range from zero to full load. All models are temperature Compensated and can be supplied hermetically sealed or fosterited. And the Sorensen line uses *less tubes* than other electronic type regulators.

- *Sorensen Engineers* are always at your service to solve unusual problems and give you the benefits of years of experience. Describe your needs and let a Sorensen Engineer suggest a solution. It will save you time and money to try Sorensen first.

TYPICAL AC REGULATORS

Model 5000-2S—high power
Input 95 to 130; distortion 3%;
load 0-5000 VA;
Accuracy ±0.1% against line or load; 50-60 cycles

Model 3000S—medium power
Input 95 to 130; distortion 3%;
load 0-3000 VA
Accuracy ±0.1% against line or load; 50-60 cycles

Model 500S—low power
Input 95 to 130; distortion 3%;
load 0-500 VA;
Accuracy ±0.1% against line or load; 50-60 cycles

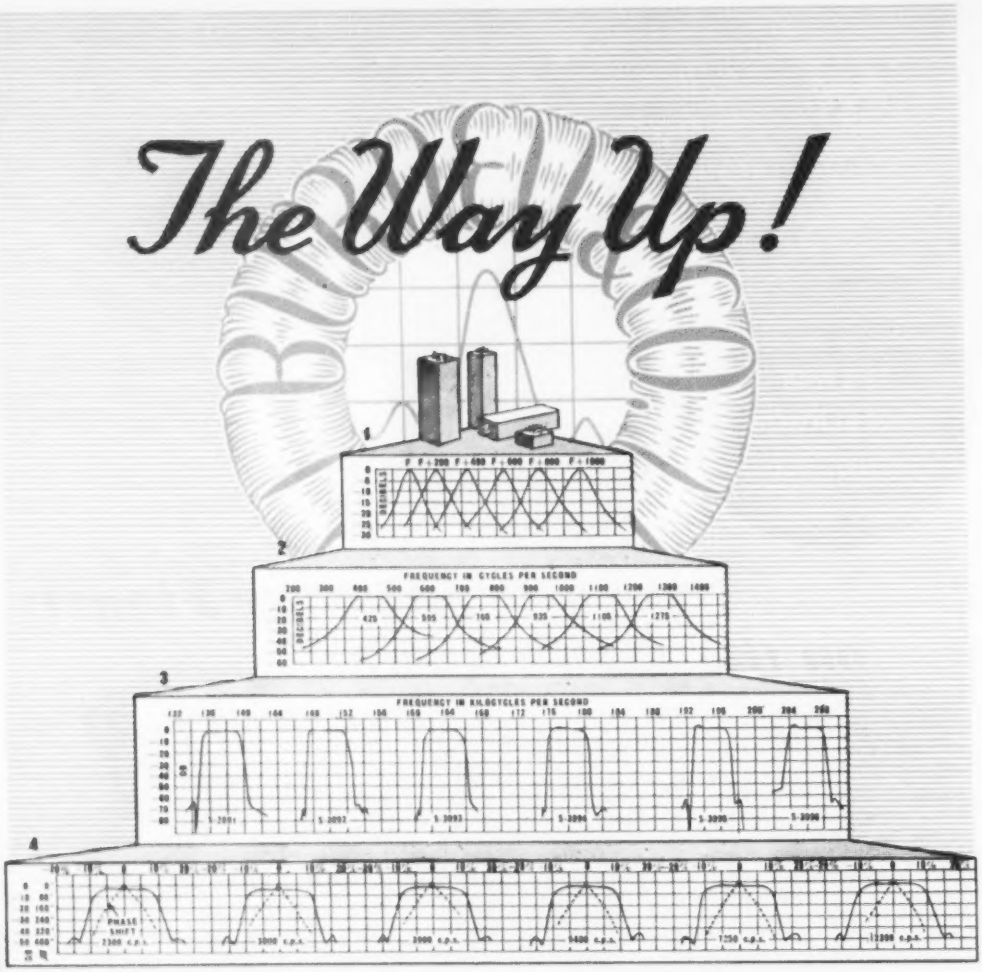
CATALOG A1049 DESCRIBES COMPLETE LINE

controlled POWER converted

Sorensen and company, inc.
375 FAIRFIELD AVE. • STAMFORD, CONN.

MANUFACTURERS OF AC LINE REGULATORS, 60 AND 400 CYCLES; REGULATED DC POWER SOURCES; ELECTRONIC INVERTORS; VOLTAGE REFERENCE STANDARD; CUSTOM BUILT TRANSFORMERS; SATURABLE CORE REACTORS

The Way Up!



1 SUB-MINIATURE "GUIDED MISSILES" FILTERS

For security reasons details of this development in miniaturization must be omitted. It can be told, however, that all six channels are contained in a total volume of 18 cubic inches or 3 cubic inches per channel.

2 TONE CHANNEL FILTERS

Available for either 170 or 340 cycles spacing between channels. These filters have received wide acceptance and are extremely popular among manufacturers of carrier telegraph equipment. In addition to the many standard types of tone filters we are supplying, special characteristics can readily be incorporated into designs to suit your application.

3 CRYSTAL ELEMENT CHANNEL FILTERS

These extremely sharp wide band filters employing crystals and toroidal coils, were so compact that they were substituted in Air Force equipment for ordinary I.F. transformers. Result was tremendous improvement in selectivity and signal to noise ratio. We derived great satisfaction from this achievement.

4 TELEMETERING FILTERS

Among the earliest to be employed in the improved telemetering system now in general use. Particular attention has been paid to linearity of phase shift and good transient suppression as well as high interchannel attenuation in order to eliminate distortion in telemetering reception.

WRITE FOR TECHNICAL INFORMATION

Burnell & Company
YONKERS 2, NEW YORK

ALL INQUIRIES WILL BE PROMPTLY HANDLED

Exclusive Manufacturers of Communications Network Components

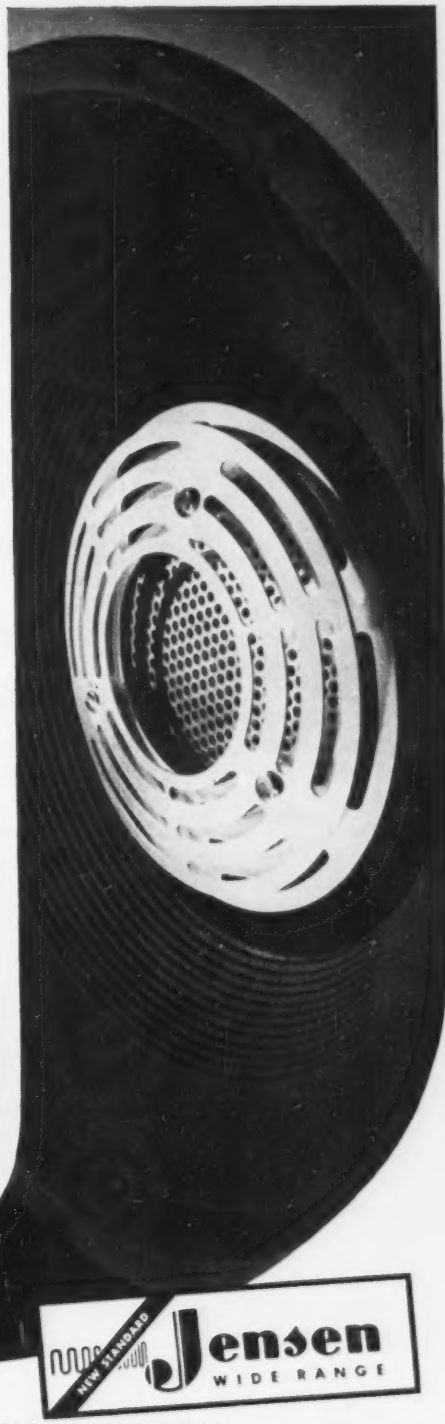
Unsurpassed!

Jensen Model 510
Coaxial Speaker

With its new high frequency driver . . . new high frequency horn . . . new low frequency unit . . . plus the new Jensen Acoustic Lens—all skillfully engineered into a coordinated unit, the H-510 gives you reproduction unsurpassed by any integral two-way system regardless of price!

Comparative tests have proved this time after time. Why? Because you instantly recognize the unusually satisfying, smooth, clean high fidelity performance . . . the easy-to-live-with quality that makes you *know* you want to own it *now*.

Ask for free booklet "Let Music Come to Life" and Data Sheet 152.

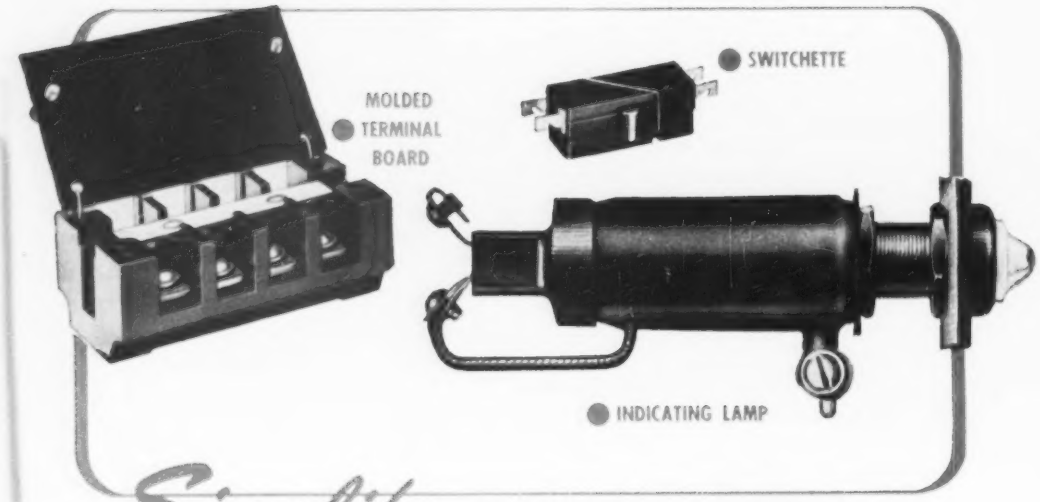


NEW STANDARD Jensen WIDE RANGE

JENSEN MANUFACTURING COMPANY DIVISION OF THE MUTER COMPANY
6607 South Laramie Avenue, Chicago 38, Illinois • In Canada: Copper Wire Products, Ltd., 351 Carlaw, Toronto

ELECTRONICS

Designers



Simplify YOUR CONTROL CIRCUITS WITH THESE G-E COMPONENTS

● MOLDED TERMINAL BOARDS—Designed to give positive electrical connection without soldering lugs, these sturdy terminal boards are built of molded Textolite ® with reinforced pole barriers. Hinged protective covers protect wiring; marking strips are reversible—white on one side, black on the other. Boards are available with 4 to 12 poles; are 2 inches wide, $1\frac{1}{4}$ inches long. See Bulletin GEA-1497.

● "SWITCHETTES"—Use them in tight places; depend on them for long life. They're available in single- or two-circuit, normally open or normally closed circuits; have momentary or maintaining contacts; are equipped with screw terminals, soldering lugs or quick-connect lugs. They're corrosion-proof, vibration-resistant, and have low r-f noise output. Ratings up to 10 amps at 230 vac. Size: $1\frac{1}{4}$ x $\frac{1}{2}$ x $\frac{1}{2}$. See Bulletin GEA-4888.

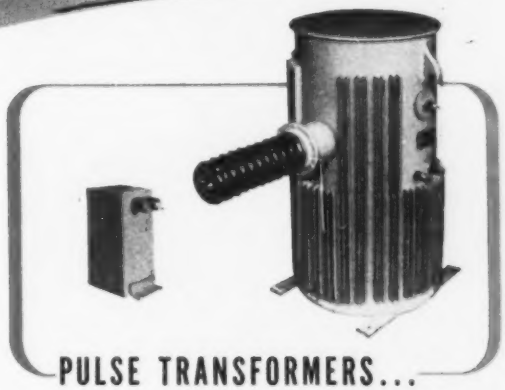
● INDICATING LAMPS—You can see from any angle whether these lamps are off or on. Color caps—made from a special translucent compound—are clear, green, red, yellow, white, or blue. Available for 24, 48, 125, 250, or 660 volts d-c; 125, 220, 440, or 550 volts a-c. Mount on panels up to 2 inches thick. All units include built-in series resistors, to insure long lamp life and eliminate the need for fuses. Size: about 5 inches long. See Bulletin GEA-3643.

GENERAL ELECTRIC

6616

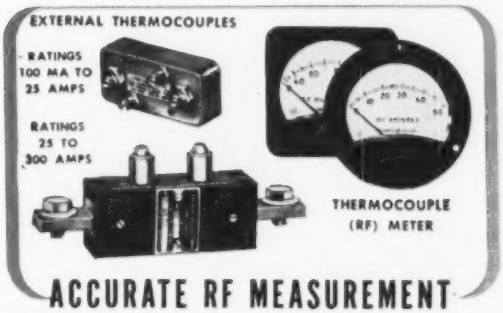
Digest

TIMELY HIGHLIGHTS ON G-E COMPONENTS



PULSE TRANSFORMERS... MIDGET OR GIANT

A six-inch midget and two-foot giant, both are examples of G.E.'s family of oil-insulated, hermetically sealed pulse transformers. General Electric has built units with peak voltage ratings of from 10 to 100 kv and over, peak power ratings up to 30 megawatts, for pulse durations of from .05 to 20 microseconds and repetition rates up to 10,000 pps. Oil filled units have also been used for lower voltages to minimize internal corona. Typical applications: pulse voltage step-up or step-down, impedance matching, phase reversing, and transmitter plate-current measurement. What is your requirement? Write, giving complete details, to Power Transformer Sales Division, General Electric Co., Pittsfield, Mass.



ACCURATE RF MEASUREMENT

100 MA to 300 AMPS

The new, sturdy, and easy-to-read G-E panel instruments are available for measuring r-f from 100 ma or less to 300 amps. R-f meters are usually supplied with internal thermocouples, but for applications where remote location of thermocouple is required, or for measuring extremely high currents (over 20 amps), external units are available. For complete data on these or other G-E panel instruments for a-c, d-c, or a-f, see Bulletin GEC-368.

New! FOR COMPACT DESIGNS MINIATURE RECTIFIER CELLS

Here's a new series of rectifier cells that can help you fit your circuit into a smaller space. These new "K-type" cells may be used to replace tubes for dual-diode, voltage-doubler, and blocking applications.

The cells are built with a new G-E evaporation process which makes for long life and stable output. Forward resistance and back leakage are low. Standard cells are moisture resistant, special units are hermetically sealed. All have a $\frac{7}{16}$-inch diameter and can be mounted as easily as an ordinary resistor. Circuits: half-wave, center tap, or bridge. Ratings: as high as 40 RMS volts input, 56.5 maximum inverse peak volts at 10 d-c ma. Data in Bulletin GEC-655.

General Electric Company, Section A667-6
Apparatus Department, Schenectady 5, N. Y.
Please send me the following bulletins:

Indicate for reference only	Indicate for planning an immediate project		
		GEA-1497	Terminal boards
		GEA-3643	Indicating lamps
		GEA-4888	Switchettes
	X	GEC-368	Panel instruments
		GEC-655	Rectifier cells

Name .....
Company .....
Address .....
City ..... State .....

SPECIALLY DESIGNED FOR USE WITH

SENSITIVE

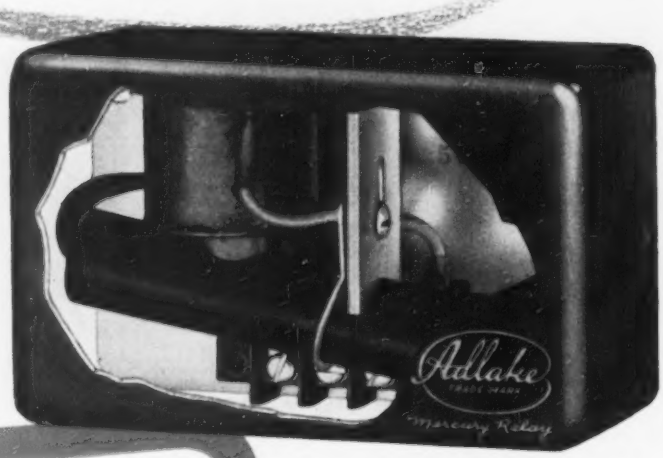
THERMO-REGULATORS

New

ADLAKE

No. 5000

Mercury Relay



Because of its amazingly high load-input ratio, the No. 5000 relay operates at 115 volts 60 cycles on *only 0.007* ampere—a fraction of the current consumed by any other type of mercury relay!

It is ideally suited for use in electronic tube circuits where the output of the tube is limited. With its low amperage operating the coil, the contacts will handle 5 amperes at the same voltage—and tests indicate the No. 5000's life to be over 30 million operations!

It can be used as a pilot relay operating from a very sensitive thermo-regulator—serves equally well for high and low temperature control—and functions perfectly with either mercury-and-glass or bi-metal regulators.

FOR FULL INFORMATION on this sensational relay, write The Adams & Westlake Company, 1107 N. Michigan, Elkhart, Indiana. No obligation, of course.

Every ADLAKE Mercury Relay offers these advantages:

- **Hermetically sealed—(dust, dirt, moisture, oxidation and temperature changes can't interfere with operation)**
- **Silent and chatterless**
- **Requires no maintenance**
- **Absolutely safe**

Manufacturers of

Hermetically Sealed Mercury Relays for Timing, Load and Control Circuits

THE

Adams & Westlake

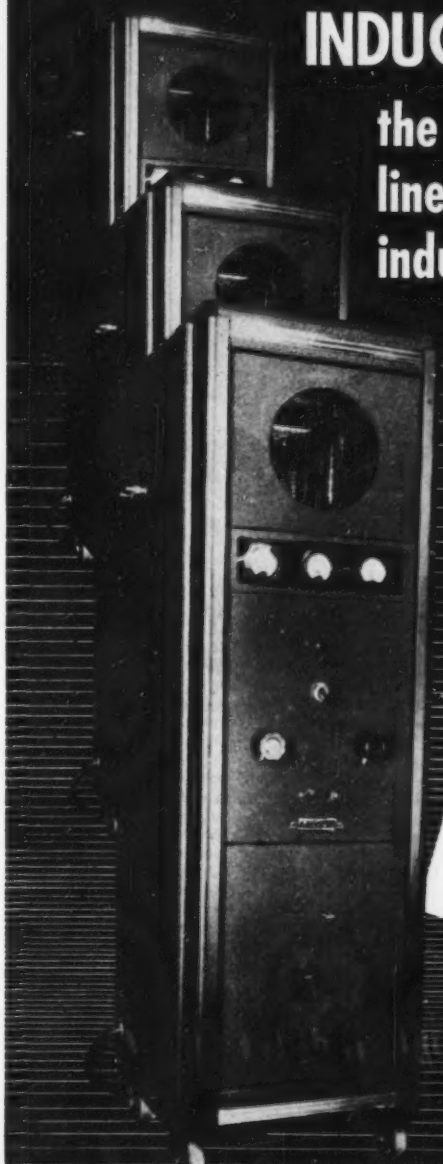
COMPANY

Established 1857 **ELKHART, INDIANA** **New York • Chicago**

HAYDU

INDUCTION OSCILLATORS...

the complete line for industry...



HAYDU BROTHERS' answer to your problem in brazing, annealing and hardening — where localized heating is important — can be solved with these machines of infinite uses. One of its important functions is the heat treatment of internal metal parts of electron tubes.

The induction oscillators can be built to any power specifications to meet individual needs.

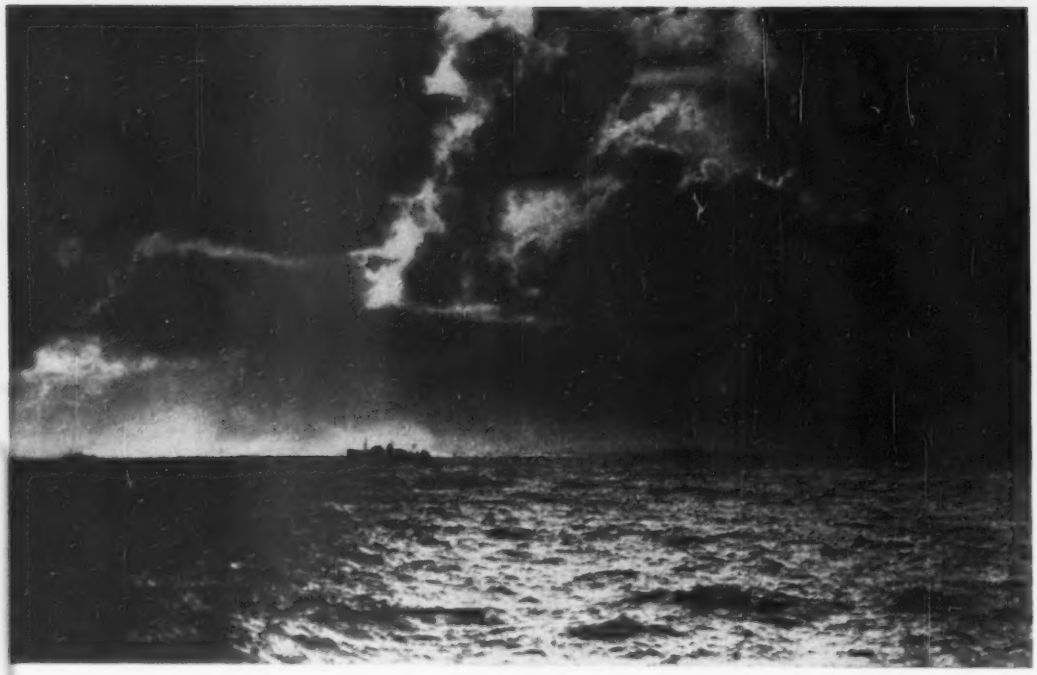
Maintenance difficulties are overcome easily in these moderately priced induction oscillators as William G. Klinder, with his many years of experience in Electronics, gave every consideration to make each part readily accessible.

Prompt delivery on standard sizes. Our plant will accept job welding work assignments.

HAYDU BROTHERS

PLAINFIELD NEW JERSEY

HB



Official U. S. Coast Guard Photo

weather... *and the unknown*

The perils of the sea can be summed up quite easily as being the Weather and the Unknown—the mystery of hitting something or being hit by something which can't be seen below the surface.

There is little which we at Edo have been able to do about the weather but new, improved electronic equipment, which our engineers and skilled craftsmen have designed and built, is doing much to take the Unknown out of what's below the waves.

Sonar equipment for charting the ocean's bottom with improved accuracy, instruments which show the shape of the harbor floor, and other underwater detection equipment are among the electronic devices being designed and perfected at Edo for added safety at sea.

SEEING THE SHAPE OF THE OCEAN FLOOR!

The Contour Bottom Scanner developed and manufactured for the U.S. Navy by Edo combines Sonar with a cathode ray tube to give an instantaneous and accurate picture of the shape of a channel or harbor floor both below and to either side of a ship, an instrument of great potential use for navigation in shallow waters.

The C.B.S. is but one of a wide variety of electronic devices developed, perfected and manufactured by Edo's staff of highly qualified electronics engineers who have behind them Edo's Twenty-Five years of diversified experience in engineering, precision manufacturing, research and development.

For a complete picture of Edo's activities, you'll enjoy reading our Twenty-Fifth Anniversary booklet. Write to Dept. ES-2, Edo Corporation, College Point, N. Y., for your copy today.

Edo

EDO CORPORATION · COLLEGE POINT, N. Y.

G-E RECTIFIER TUBES

BASIC IN BROADCASTING

They're dependable!

YOUR supply of d-c power ranks high among requirements for signal power and continuity. By installing rectifier tubes that serve reliably, you've taken a big step toward peak transmitter output with minimum time off the air. *Assure tube reliability by choosing General Electric!*

Here are products pre-tested for quality (built of selected materials by the most modern manufacturing methods, with inspection at every stage), and pre-tested for performance in two important ways: (1) as tubes, after manufacture, (2) as types, by use in broadcast stations from coast to coast, where G-E tubes enjoy a none-better record.

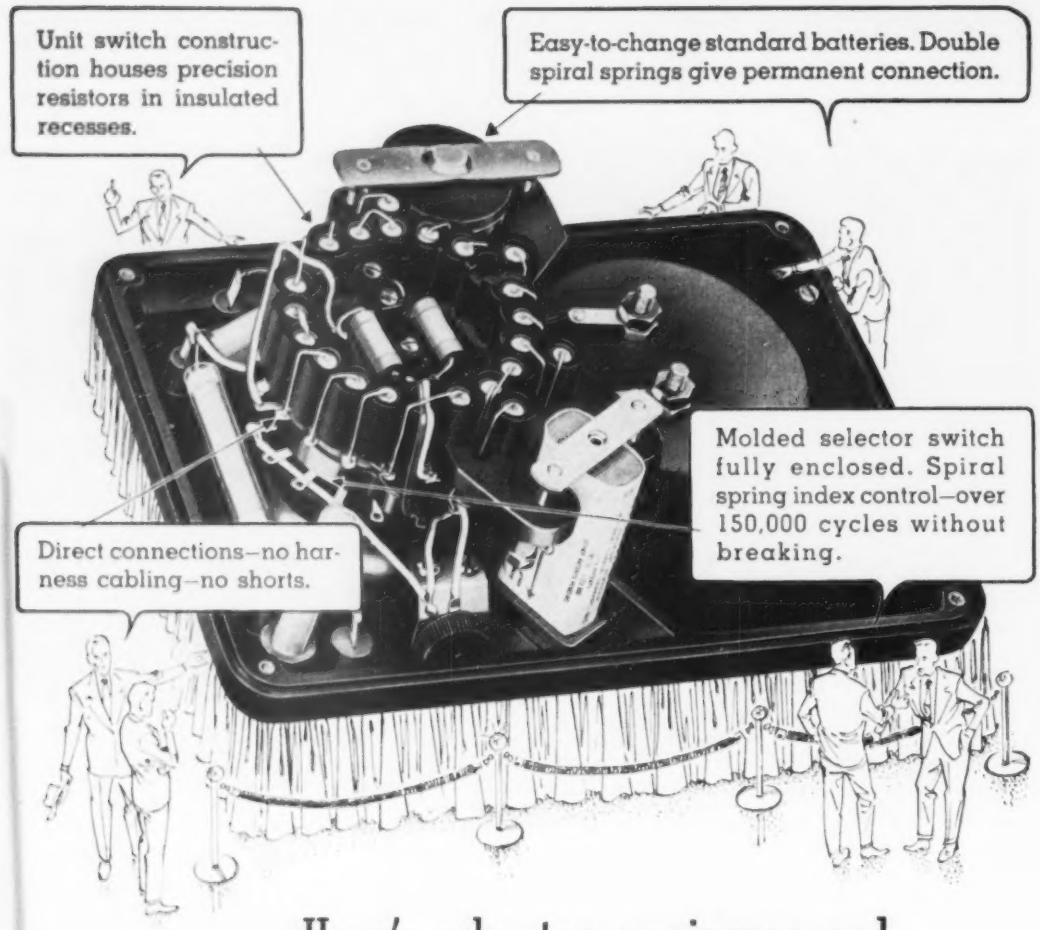
General Electric also brings you constant design improvements. *Example:* the straight-side bulbs of the GL-8008 and GL-673 give an increased temperature margin of safety, make these tubes easier to handle and install. *Example:* future heavy AM-FM-TV power requirements are anticipated by new G-E tube developments such as the GL-5630 ignitron, which will supply direct current in impressively large amounts.

If you build or design transmitters, phone your nearby G-E electronics office for expert counsel on rectifier tubes. If you are a station operator with tube replacements in mind, your G-E tube distributor will be glad to serve you promptly, efficiently, out of ample local stocks. *Electronics Department, General Electric Company, Schenectady, 5, New York.*

GENERAL ELECTRIC

180-24

Type	Cathode voltage	Cathode current	Anode peak voltage	Anode peak current	Anode avg current
GL-866-A	2.5 v	5 amp	10,000 v	1 amp	0.25 amp
GL-8008	5 v	7.5 amp	10,000 v	5 amp	1.25 amp
GL-673	5 v	10 amp	15,000 v	6 amp	1.5 amp
GL-869-B	5 v	19 amp	20,000 v	10 amp	2.5 amp
GL-857-B	5 v	30 amp	22,000 v	40 amp	10 amp


Unit switch construction houses precision resistors in insulated recesses.
Easy-to-change standard batteries. Double spiral springs give permanent connection.
Molded selector switch fully enclosed. Spiral spring index control—over 150,000 cycles without breaking.
Direct connections—no harness cabling—no shorts.

Here's why top engineers and technicians use Model 630

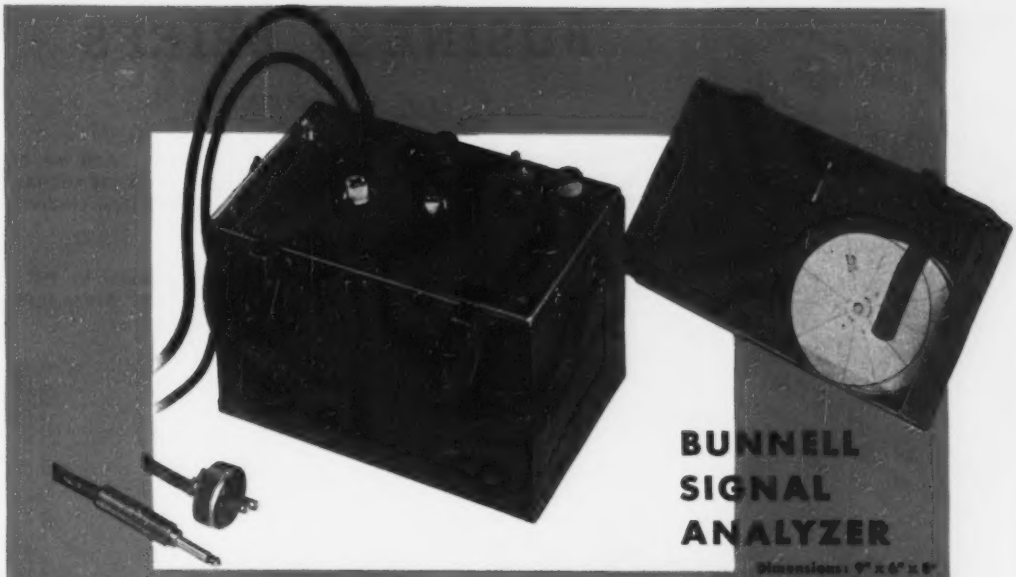
Features like those shown above are what make this popular V.O.M. so outstandingly dependable in the field. The enclosed switch, for instance, keeps the silvered contacts *permanently clean*. That's rugged construction that means stronger performance, longer life. And tests show that the spiral spring index control, after more than 150,000 cycles of switch rotation, has no disruption or appreciable wear! Investigate this history-making Volt-Ohm-Mil-Ammeter today: 33 ranges, large 5½" meter.

ONLY
$37.50
AT YOUR DISTRIBUTOR

FOR THE MAN WHO TAKES PRIDE IN HIS WORK

Triplett

TRIPLETT ELECTRICAL INSTRUMENT COMPANY · BLUFFTON, OHIO, U.S.A.



BUNNELL SIGNAL ANALYZER

Dimensions: 9" x 6" x 8"
Weight: 15 lbs.

THE ONLY CARRY-ABOUT

TELEGRAPH TROUBLE-SHOOTER SOLD *that provides* A PERMANENT RECORD *of Transmission Quality*

Checks Transmission Quality

Indicates any type of signal irregularity in 7-unit or 7.4-unit code start-stop telegraph circuits. Records distortion on every individual signal pulse as it is received. Can be used to determine condition of signals from transmitting keyboards or regenerative repeaters. Useful in checking operation of receiving printers. Helps assure high transmission quality and continuity by detecting incipient troubles before printing failure occurs.

Time-Saving . . . Economical

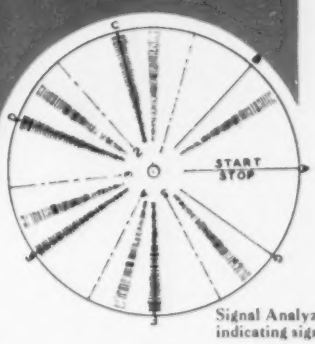
Saves circuit time by helping to correct error quickly. Saves time of operating, service and maintenance personnel.

Provides Permanent Record

Records signals permanently on paper chart for detailed analysis, quantitative measurement and future reference or comparison. Permits observation of distortion on working circuits and quick identification of sources of error. Useful in alignment and trouble-shooting.

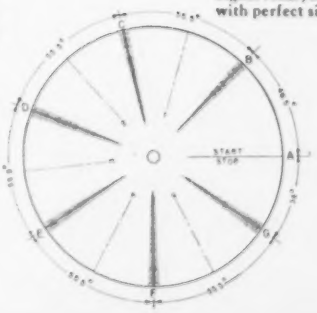
Portable . . . Easy to Use

Light, simple and compact in design and construction. Can be moved easily from place to place as needed. Easy to connect, easy to operate. No adjustments or complicated connections required—just plug in and turn on.



Signal Analyzer chart indicating signal error

Signal Analyzer chart with perfect signals



J. H. BUNNELL & Co.

81 Prospect Street, Brooklyn, N.Y., Dept. 15

BUNNELL—a key word in communications equipment ▶ **Research, Engineering, Production and Testing Facilities For Electronic and Communications Equipment.**

the New
PYRAMID
"Humidi-Seal"
(TUBULAR PAPER CAPACITOR)

Repels Moisture!
PYRAMID
HUMIDI-SEAL
.05 MFD.
600 V.D.C.
Ruggedly built to withstand undue vibration and rough handling
Outer tube plastic impregnated to prevent moisture absorption
Light outer coat of high temp wax provides double protection
Each end plastic sealed against moisture
Leads anchored securely in solid plastic end

Type 85TOC "Humidi-Seal" capacitors are specially designed for 85° C. operation, even in the most humid atmospheres, and will meet the severe present-day demands of endurance in television receivers, auto radios, etc.

WRITE FOR COMPLETE LITERATURE

Representatives and Distributors throughout the U.S.A. and Canada

PYRAMID

PYRAMID ELECTRIC COMPANY
155 Oxford Street
Paterson, N. J., U.S.A.
TELEGRAMS: WUX Paterson, N. J.
CABLE ADDRESS: Pyramidusa

BUSINESS BRIEFS

By W. W. MacDONALD

Third-Quarter Outlook for American business in general now looks good, and most economists who predicted a healthy first-half earlier this year but refused to stick their necks out further have since extended their optimism through September. In the field of electronics, specifically, things look particularly healthy. Most manufacturers we have talked to recently anticipate good business right through the fourth-quarter.

Auto Radio Business, second only to television in radio industry importance at the moment, is booming. Car manufacturers working into a backlog of orders developed during recent strikes expect to turn out between 6 and 6½ million automobiles in 1950 if no further shutdowns occur. Return to more normal market conditions in 1951 should support the production of between 4½ and 5 million new cars.

Shortage of ceramic-and-powdered-iron cores that have proven especially efficient in television-receiver sweep-circuit coils is currently troubling some set makers. Manufacturers of such cores are increasing production to meet the unexpectedly heavy demand but from where we sit it seems doubtful that they will be able to catch up until Fall at the earliest.

Informal Poll of RMA Directors produces an estimate of 5,350,000 tv sets in 1950, the high guess about production being 6,500,000 and the low 4,500,000. The estimate in a similar poll taken last February was 4,500,000.

TV Interference caused by oscillator radiation is reduced by the use of RMA-recommended 40-mc i-f in some makes and models now reaching the market.

Three-Color RCA television-picture-tube screen employing triangularly grouped dots of different phosphors is produced by an almost unbelievably accurate printing technique. And we of the printing business are not easily moved to superlatives concerning color registry.

Television Shipments by RMA members totalled 2,227,973 in 1949. Here's the breakdown:

Albany	27,032
Albuquerque	758
Atlanta	14,242
Baltimore	62,175
Birmingham	5,679
Boston	143,669
Buffalo	41,201
Charlotte, N. C.	7,031
Chicago	230,845
Cincinnati	73,890
Cleveland	75,411
Dallas	14,802
Davenport, Ia.	6,684
Detroit	109,307
Erie, Pa.	4,240
Greensboro, N. C.	1,862
Houston	6,802
Huntington, W. Va.	2,650
Indianapolis	14,270
Jacksonville	3,160
Kansas City, Mo.	25,076
Los Angeles	196,941
Louisville	9,250
Memphis	5,356
Miami	6,228
Milwaukee	34,335
Minneapolis	29,440
Nashville	342
Newark	152,090
New Haven	29,801
New Orleans	7,239
New York City	368,655
Oklahoma City	8,423
Omaha	10,381
Philadelphia	206,073
Phoenix	2,166
Pittsburgh	48,958
Portland, Ore.	1,041
Richmond	8,753
St. Louis	45,328
St. Petersburg	284
Salt Lake City	4,218
San Antonio	4,690
San Francisco	29,705
Seattle	9,038
Syracuse	15,937
Toledo	25,988
Tulsa	7,194
Washington, D. C.	57,551
Unallocated	31,732

Certain printed-circuit techniques now coming into vogue are similar, believe it or not, to a process suggested in 1888 for the marking of tombstones.

Industrial Users of small radio-receiving-type tubes contacted in our continuing study of the need for types having longer life invariably say they are willing to pay more for a substantial improvement. But when it comes to actually laying extra dough on the line there is naturally some quibbling.

Just what is a "substantial improvement?" How much is "more?" Tube makers tell us that refinements run costs up sharply. And the cost problem is further

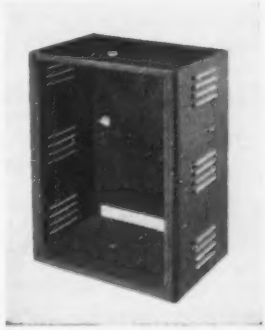
uniformity

Not a foot out of step, not a figure out of line. That's uniformity! Karp Products, too, are always "in line," following the most exacting and precise specifications. That means a saving of time and money on your assembly line. "Uniformity" brings greater efficiency into your production.

Our new 70,000 square foot plant has extensive facilities, including an accumulation of dies and jigs which permits us to fabricate at minimum cost, whether your job is a single unit or a large quantity.

Twenty five years' experience has given our craftsmen a "know how" which is reflected in Karp's quality and accuracy. And you can have this service at competitive prices.

Let us quote on your next requirement of metal cabinets, consoles, chassis, and enclosures. Write today for your FREE copy of our illustrated data book.



KARP METAL PRODUCTS CO., INC.

215-63rd Street, Brooklyn 20, New York

SHOCK AND VIBRATION NEWS

ECLIPSE-PIONEER

DIVISION OF

Bendix

AVIATION CORP.

uses

AIR DAMPED BARRYMOUNTS

FOR ASSURED CONTROL of SHOCK and VIBRATION

At high altitudes, the performance of aircraft radar, radio, ignition, and fuel systems depends on pressurization by this Eclipse-Pioneer unit whose sensitive aneroid switch mechanism must be guarded against shock and vibration.

For this critical task, air-damped BARRYMOUNTS were chosen by Eclipse-Pioneer engineers after tests proved they isolate vibration with no snubber contact at any frequency — even at resonance.

The Eclipse-Pioneer unit is shown on a BARRY standard mounting base assembly which permits rapid installation or removal of the pump and control unit.

Free Catalogs **give dimensions and load ratings of stock BARRYMOUNTS. Catalog 502 covers aircraft applications. Catalog 504 covers industrial and general-purpose mountings. WRITE TODAY to**

THE BARRY CORP.

Main Office 177 Sidney St. ● Cambridge 39 Massachusetts

New York Rochester Philadelphia Washington Cleveland Dayton
Chicago Minneapolis St. Louis Los Angeles Toronto

complicated by the fact that the demand for small industrial tube types is still materially less than for comparable communications types.

Certainly there can be no close comparison of the price of large-volume radio-receiving tubes and smaller-volume longer-life industrial tubes. The economic desirability of the latter has to be judged on the basis of reduced industrial apparatus down-time.

Machlett Labs furnishes the following examples of industrial economies effected by the use of induction heating:

Connecticut Instrument Manufacturer

Product	Previous Unit Cost	Induction Unit Cost
Thermocouple wells, brazed	$ .068	$ .037
Spring, tempered	.024	.007
Well for recorder, soldered	1.70	.50
Lever, brazed	.035	.014
Vat fitting, brazed	.68	.20
Damping magnet, brazed	1.18	.17
Connector, soldered	.061	.034
Flange, soldered	1.36	.051

Wisconsin Gear Manufacturer

Furnace Heat		Induction Heat	
Heat-treat	$ .53	Broach clutch	$1.06
Grind	.64	Induction-harden	.03
Finish clutch	.11	Broach gear	.13
Heat, press, grind	.77	Induction-harden	.13
	$2.05		$1.35

Washington Hatchet-Head Manufacturer

Flame Tempering (per hour)		Induction Tempering (per hour)	
Fuel	$ .90	Oscillator power	$ .135
Two men, machine	1.00	Control power	.04
Labor, cleaning	.90	One man	1.00
Power, conveyor	.04	Cooling water	.108
Naphtha, cleaning	.05	Tube replacement	.10
	$3.79		$1.383

Electronic Equipment Manufacturer

	Torch-Braze Unit Cost	Induction-Braze Unit Cost	Production Increase
Cylinder assembly	$ .567	$ .095	495%
Pivot elbow	.150	.119	160
Tube head	8.40	1.78	475
Hose assembly	.150	.086	174
Conductor-plug assembly	.094	.054	174
Push-rod assembly	.035	.021	166
Echo-box cap boring	.100	.074	135

We're wide open for more examples.

One Unhuman Bridge between the wiggling meter pointer (or squiggling c-r spot) and the printed or punched-card output of a business-type machine is Metrotype Corporation's automatic data recorder, called to our attention as one answer to our *Business Briefs* plea (March, p 60) for something to help man digest the voluminous data being gathered today by electronic measuring and

telemetering gear.

This particular robot takes in voltages (into which most any other quantity can be converted) and uses a step voltmeter to generate a number of pulses proportional to the voltage being measured. From there we go into a myriad of electronic counters, memories, number mixers and suchlike that in the end make an appropriate teletypewriter character sock paper at an appropriate position. Perhaps not quite that simple—the gear fills a tall relay rack—but it works, without human attention or human errors; best of all, results come out in simple arithmetic right in the same room or hundreds of miles away over a two-wire phone line.

Here's one long step in the right direction.

A Friend Of Ours owns a small plant devoted to the repair and installation of marine electrical and electronic equipment and the manufacture of marine telephones. He's looking for an additional line, something not too remote from his business and not too tough to make and sell.

We hear about lots of firms in this position and will be glad to pass along to them the names of readers who have ideas, particularly if design work is fairly well advanced.

Radar will be in use aboard 202 Great Lakes freighters, or 64 percent of the total number, by the end of the year, predicts C. M. Jansky, consultant for the Lake Carriers Association. Some 1,200 radiophones will be in use aboard U. S. and Canadian vessels plying the same waters.

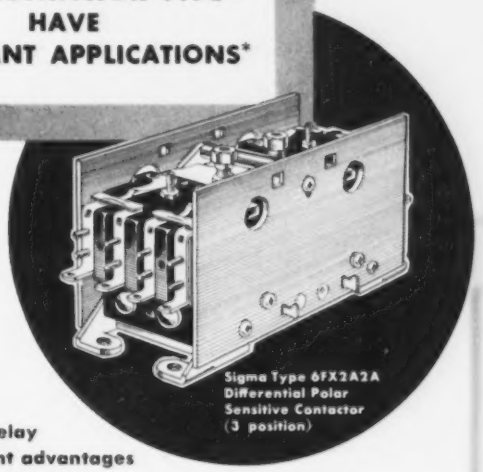
Summer Complaint apparently permeates all strata of society.

While passing through an experimental tube laboratory the other day we noted faint wisps of smoke coming from a transparent hydrogen furnace but, peer as we would, there was no trace of the object being heated. A young lady longingly looking outdoors at the birds, bees and flowers and apparently in charge was questioned and took one startled look.

"My God," she said, "I forgot to put the work in there!"

servos

OF THE CONTACTOR TYPE— HAVE IMPORTANT APPLICATIONS*



Sigma Type 6FX2A2A Differential Polar Sensitive Contactor (3 position)

This Sigma Relay has significant advantages as the output device

Gain—Besides obvious advantages in reduction of complexity of principal circuits, capacity and weight of power supplies, etc., additional gain afforded by any link in a closed loop system permits enhanced stability through more feedback; greater system sensitivity and accuracy; less droop and faster response. These advantages may be taken in various combinations.

Standard Sigma Series 6-X contactors will control from one to four circuits each rated 5 Amps at 110v ac at a differential power sensitivity of 16 milliwatts per pole — power gain, 34000: 1.

Type 6FX2A2A (above) has two double-break normally open switches on each end; with two 12000 ohm windings it operates at 1.6 ma differential current, either way depending on polarity.

Self Balance—In a servo requiring correction in either of two directions, this Sigma relay replaces two conventional relays corresponding to the two directions. In a typical push pull "DC" amplifier circuit it eliminates all concern over magnitude of plate currents at "null." With one of its windings in each plate circuit it responds *only* to differential current.

Its balanced armature can assume either of two operated positions (depending on polarity of signal) or a neutral, and it has *positive detent in all 3 positions.*

Adverse Environment — Combination of an almost perfectly balanced armature and substantial operating forces with rugged box-like structure produces high immunity to shock and vibration. Choice of materials and processes is suitable for service from —55° to —85° and up to 95% R.H. Hermetic Sealing is also available.

Speed of Response — Although the unit in question is by no means the fastest of relays, its dynamic efficiency is such that in many circuits it will respond in less than 10 milliseconds. Such response occurs when the coil circuit has relatively high source impedance.

Our general catalog, which describes many other useful types lists a large group of available standard coil and contact combinations for the SIGMA SERIES 6 relays.

*See our advertisement in this space, May issue.

SIGMA Instruments, Inc.
SENSITIVE RELAYS
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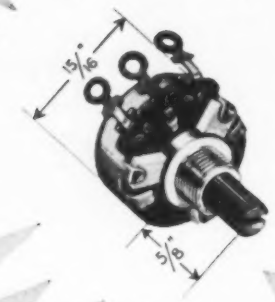

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Electrical characteristics specially designed for critical applications in television, radio and other circuits. Insulated shafts are knurled for ease in adjustment. Shaft and current-carrying parts provide 1500 volt insulation . . . ⅝" diameter saves space. Precision-controlled carbon element provides smooth tapers, quiet operation, accurate resistance values, less drift in television applications.

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CROSS TALK

▶**CPB . . .** A month or two ago (on another network, *Proceedings IRE*, March, 1950, p 227), we held forth as a guest editorialist concerning the importance of radio engineers in advising the government, placing particular emphasis on the RTPB, JTAC, NTSC type of organization. Since then has come word of the formation by President Truman of the Communications Policy Board (April issue, p 130) which is to undertake a sweeping review of the basic communications needs of the country, and to study the conflicts and inequities which beset the use of the radio spectrum. The five members of the board are the presidents of MIT, Caltech, and West Virginia University (Drs. Killian, DuBridge and Stewart), a former president and current board member of the IRE (Dr. Everitt), and a man thoroughly familiar with military communications requirements (Mr. O'Brien). They are asked to study the use of radio and wire facilities by government and non-government agencies and to recommend to the president, by October, 1950, a sound communications policy, in the national and international spheres. Certainly the board members are qualified, by position and experience, to accomplish this enormously important task competently and equitably. Considering the number of special, vested, and highly-vocal interests who have an important stake in the outcome of their deliberations, their task is not to be envied.

Inevitably they will compare the modus operandi of the FCC, which regulates the use of radio by non-government users (all of which must justify the use at length) with that of the IRAC, which regulates government users (without a comparable justifying procedure). Surely also they must come to grips with the problem of spectrum space reserved for future use but not used at present, the problem of point-to-point channels occupied 50 percent or more of the time with the repetition of call letters, with the general waste of a precious public domain. Many, in fact, are the heads that must be knocked together before the spectrum is equitably and fully put to use. The good wishes of the radio profession go to the CPB.

▶**LANDLORD . . .** The tendency of "the management" to interfere with engineering progress is a common complaint. Now comes an example in reverse.

For years, f-m and tv broadcast engineers have urged that several stations should occupy jointly the best transmitting site in a given locality. Major Armstrong hung six arms on his Alpine f-m tower with this philosophy in mind. This system not only provides strong signals but also maintains the adjacent signal ratio near unity throughout the service area, with benefits to all concerned. But the disinclination of broadcasters to share a good thing with the competition is understandable. So, since 1930 or thereabouts, NBC has been the sole broadcasting occupant of the Empire State tower.

Now all this is changed. WJZ-TV has moved to Empire State alongside WNBT. WCBS-TV has announced plans to move, as soon as the new 200-foot antenna tower is ready, as have stations WPIX and WABD. And the Empire State people feel that they may be able to make room for all seven stations now assigned in the New York area.

This is indeed progress. We would like to report that this progressive step could be traced to the impassioned pleas of engineers of the competing networks, and the gracious assent of the NBC engineers. But no. The credit goes to management. Whose management? The owners of the Empire State Building. And what did it? An outsize increase in the rent, gentlemen. That's what did it.

Seriously, all concerned are to be congratulated. By 1951, New York should have by all the odds the best television service, technically speaking, in the world. And there's no patent on the idea. Boston, Philadelphia, Chicago, San Francisco and Los Angeles papers, etc, please copy.

▶**TAPE APLENTY . . .** Howard Chinn's suggestion for recording television transcriptions on magnetic tape (*Crosstalk*, February, 1950) has called forth a masterly analysis of costs by John Boyers of Magnecord. Mr. Boyers' letter (*Backtalk*, this issue) points out that, on reasonable assumptions, a 15-minute video tape program would require about 37,500 feet of tape, at a list price of $1,375! Impractical on the face of it but, says Boyers, "I am sure the job will be done before too long."

Plastic-

By WILLIAM R. CUMING
Emerson & Cuming Company
Boston, Mass.

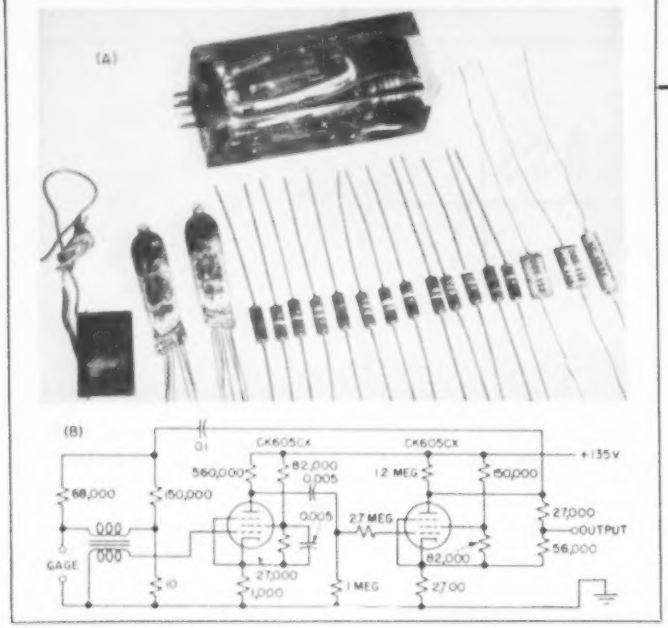


FIG. 1—(A) Plug-in oscillator for vibrating-wire-type pressure gage used for guided-missile telemetering application and, in foreground, the component parts embedded therein. (B) Circuit of the oscillator

CONSIDERABLE INTEREST has developed within the electronics industry concerning the embedment of circuits and components in rigid plastic materials. The technique is sometimes referred to as casting.

In brief, it consists of: (1) preparing a mold of the proper size and shape, (2) setting the circuit or component in the mold, (3) pouring a prepared liquid resinous material into the mold, and (4) polymerizing the resin into a rigid solid. The mold is then removed.

Embedment materials with excellent physical and electrical properties are available. For example, it is possible to embed in essentially pure polystyrene, a plastic notable for its electrical properties. Moreover, materials with made-to-order properties may be formulated for specialized applications. Materials may be transparent or opaque. Coloring possibilities are almost unlimited.

Applications for plastic-encased units are increasing rapidly. A few of the benefits derived from embedment are:

(1) Hermetic sealing.
(2) Ruggedization and shockproofing.
(3) Elimination of mountings.
(4) Use of bare point-to-point wiring for rapid circuit assembly.
(5) Miniaturization and utilization of plug-in subassemblies.
(6) Stabilization of electronic operation.

Suitable Materials

The coating and potting of electrical components in waxes or resinous materials has been done for many years. Often a container is used to hold the component and the potting compound. However, in general the potting compounds of the electrical industry are not suitable for electronic applications. High-frequency, high-impedance circuits require materials of superior electrical properties. Sensitive electronic components can not be subjected to the high temperatures needed to make most potting compounds pourable.

In some instances, embedment has been accomplished by using conventional injection or compression-molding methods. High temperatures and pressures, however, limit the usefulness of this technique. In addition, the capital outlay for equipment has generally confined molding to large-volume units.

For many years, a few concerns have embedded objects in methyl methacrylate (Lucite and Plexiglas) by a low-pressure casting process. This technique has largely been limited to objects used for display purposes. Methyl methacrylate, although unsurpassed for its optical properties, is not particularly good with respect to electrical properties.

In 1947 the National Bureau of Standards announced the development of a casting resin termed NBS Resin. This material had excellent electrical characteristics and was widely used as an embedment medium in electronic laboratories. It is expensive and not plentiful.

In recent years a good deal of work has been done in chemical laboratories on materials which can be polymerized, that is, transformed from the liquid to the solid state by a low-pressure, low-temperature process. In the course of these investigations materials and techniques which permitted casting and polymerization right in the mold were developed.

Polymerization denotes a chemical reaction wherein distinct molecules react with one another to form a larger molecule. For example, styrene, a liquid hydrocarbon, polymerizes to form polystyrene. Styrene is referred to as a monomer (single molecular structure) whereas polystyrene is the resulting polymer. In cases where two distinct chemical compounds enter into a reaction it is often referred to as copolymerization. The latter is the reaction which most commonly-used embedment plastics undergo.

It is well known that certain chemicals catalyze (or hasten) polymerization and copolymerization reactions even when used in very

Embedded Circuits

Casting of component parts within materials suitable for electronic applications eliminates chassis, permits bare point-to-point wiring and provides miniaturized and stable plug-in units. Here is how it is done

small proportions. The most important of these catalysts are organic peroxides, benzoyl peroxide for example. In addition, other compounds, notably heavy metal salts and tertiary amines, activate the catalyst to give even more rapid polymerization. These compounds have been termed accelerators. Heat may also be applied to speed the reaction. The choice of a catalytic system for a particular application is not a simple matter.

Currently popular embedment compounds are polyesters. Polyesters are the resinous reaction products of organic unsaturated acids and alcohols. They may be used as such for embedment but are most commonly diluted with styrene. A wide range of physical and electrical properties in the copolymerized plastic is achieved by selection of the appropriate polyester or combination of polyesters and the proportion of styrene used. Further modification is possible by the use of fillers and plasticizers. Fillers include mica dust, milled glass filaments and cotton linters. Plasticizers are normally liquid additives, used to increase flexibility, particularly for low-temperature operation.

Polystyrene may be used in embedment applications where the optimum in electrical characteristics is desired. One completely polymerized polystyrene casting resin has the electrical properties indicated in Table I.

Table I—Typical Polystyrene Casting Resin (*Stycast*)

Frequency	Dissipation Factor	Dielectric Constant
100 cycles	0.00098	2.596
1 kc	0.00062	2.595
10 kc	0.00047	2.592
100 kc	0.00096	2.588
1 mc	0.00084	2.582

Characteristics

Dependent upon the application, there are many specific requirements placed on an embedment plastic. The difficulty of combining all of the best characteristics in a single compound is evident. Fortunately all are seldom, if ever, required simultaneously for any single application.

In order to give a general idea of properties which can be expected of a typical unfilled polyester-type resin, Table II is included. Properties refer to only one resin. It is possible to modify them greatly.

A few of the more important properties of embedment plastics are discussed briefly below.

Electrical Properties—Polystyrene is the most satisfactory material with respect to general electrical properties. It is a thermoplastic material and will, therefore, soften at approximately 80 C. It should not be used as an embedment medium at temperatures below —10 C because of brittleness.

High Temperature—Resins with high polyester content and mineral filler are best suited to high-temperature applications. The polyester resins are thermosetting. They do not flow at high temperatures. Decomposition or degradation of the plastic will, however, result from excessive temperature operation.

The temperature reached at hot spots within an embedment depends upon a number of factors associated with the heat-generating and heat-transmission path. Careful physical design of circuitry and use of a high heat-conductivity resin consistent with satisfactory electrical properties are good approaches to this problem.

Mineral-filled polyesters have been subjected to hot-spot temperatures (at embedded vacuum-tube surfaces) of 300 C for half-hour periods without ill effects. Under prolonged operation hot-spot temperatures should be limited to 160 C. Some embedment compounds now under development indicate that this temperature limit will be raised.

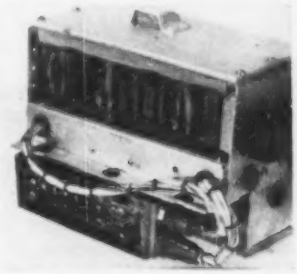


FIG. 2—Missile-borne telemetering system employing the technique

Recent data on resistors embedded in one-inch cubes of resin with thermal conductivity of 2.3×10^{-4} gm-cal per cm² per sec per deg C per cm indicates that the surface temperature of the resistors will be 35 to 45 C above the ambient-air temperature when operated at normal rated dissipation. Operating at half rated dissipation will approximately halve the temperature rise.

Low-Temperature Operation—The use of plasticizers and reenforcing-type fillers is effective in permitting operation at low temperatures. Embedments suitably prepared have been taken down to temperatures as low as —80 C with no adverse effects. These same embedments will withstand operation at least to 110 C.

High Thermal Conductivity—High thermal conductivity may be achieved by the use of high-conductivity fillers; even metallic fillers are

possibilities. Achieving good thermal properties is always a compromise with electrical properties. Embedment of cooling fins has also been used effectively.

Thermal Expansion Coefficient—Thermosetting embedment resins with high mineral-filler content have been prepared to have expansion coefficients below 20 parts per million per degree C. It is sometimes desirable to use a resin with the same coefficient as the embedded object. Within limits this may be done by proper blending of the resin mix.

Shrinkage—Shrinkage during copolymerization is roughly 8 percent by volume. The total volumetric change, however, is not effective in causing pressure on the embedded units. This is due to the fact that during copolymerization the density of the resin increases while it is still liquid. At a later point a weak semi-solid gel forms. Shrinkage from this point is only a few percent. The use of polymerized resin dissolved or dispersed in the liquid resin is effective in minimizing shrinkage effects.

Optical Properties—These plastics may be water-white. By the use of selected dyes and pigments opaqueness and colors in infinite variety are obtainable. Identification tabs may be enclosed in transparent units. Lettering may be cast on the surface of an embedment or may be finally engraved or printed.

Adhesion—The adhesion to glass, metal or ceramic surfaces depends upon (a) the resin used, (b) the physical configuration of the embedment, and (c) the condition of the surface. Certain resins show excellent adhesion. However, if a resin is selected on the basis of other characteristics, adhesion may usually be accomplished by use of another resin for a priming coat. It is best to have shrinkage take place toward the surface to which adhesion is desired. Rough, clean surfaces are superior to smooth surfaces upon which foreign matter is present.

Embedment Method

A step-by-step procedure for the embedment of a simple circuit in the resin whose properties are listed in Table II is given below for illustration.

Components are wired together in accordance with a circuit diagram. Maximum use is made of bare point-to-point wiring. Components which dissipate heat are located in such a manner as to minimize heat concentration. In general, miniature components may be used to achieve maximum space saving. A small connector is used for mounting. Upon completion of wiring, and before embedment, the circuit is checked for proper operation.

The mold is made of metal, plaster-of-paris or cardboard. Normal mold-making principles, such as clearance and taper, are adhered to. A means of supporting the circuit is provided. The inside of the mold is coated with an appropriate parting agent such as silicone oil. The circuit is placed in the mold.

The needed quantity of resin is weighed out. A measured amount of peroxide catalyst is added and stirred in. This will be of the order of one percent of the resin weight. An accelerator may also be added at this time. The prepared resin is poured into the mold. Entrapped air bubbles will rise and can be completely removed by subjecting the unit to vacuum.

The unit is set aside to copolymerize. Placing in an air oven at about 55 C will hasten this process. Rapid copolymerization increases the danger of cracking in the finished unit. In critical situations copolymerization is sometimes accomplished under refrigeration. A final brief oven cure completes the reaction. Removal from the mold, cleaning and polishing (if desired) yields the plastic packaged unit.

Practical Examples

A few examples will serve to illustrate embedment possibilities.

At Massachusetts Institute of Technology, project Meteor, a guided-missile development, has the problem of miniaturizing and ruggedizing a complex electronics system. Moreover, the system may sustain long periods of inactivity, but must function precisely when called upon. Hermetic sealing is thus a necessity. The use of individual plug-in subassemblies is desirable so that repairs can be made rapidly and accurately.

Figure 1A shows a typical unit. The components which are assembled into the unit are shown below it; the circuit diagram is shown in Fig. 1B. This particular unit is an oscillator for a vibrating-wire-type pressure gage. The finished unit has a volume of approximately one cubic inch.

A missile-borne telemetering system is shown in Fig. 2. The major chassis contains 28 embedded plug-in units. These are oscillators, multivibrators and clippers. In the foreground is an embedded matrix

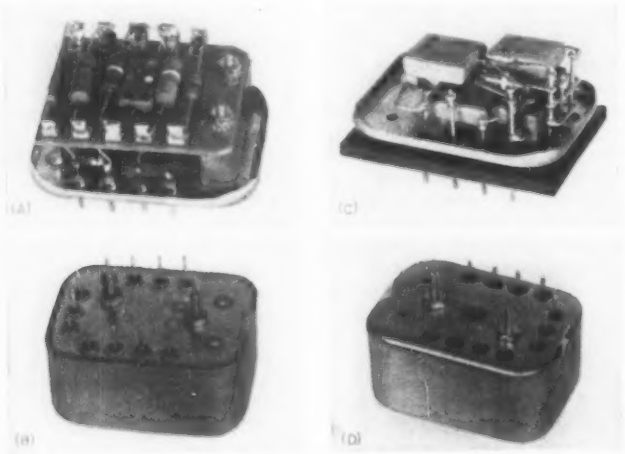


FIG. 3—Old and new techniques employed in assembling an industrial instrument subassembly, the former shown at (A) and (B) and the latter at (C) and (D)

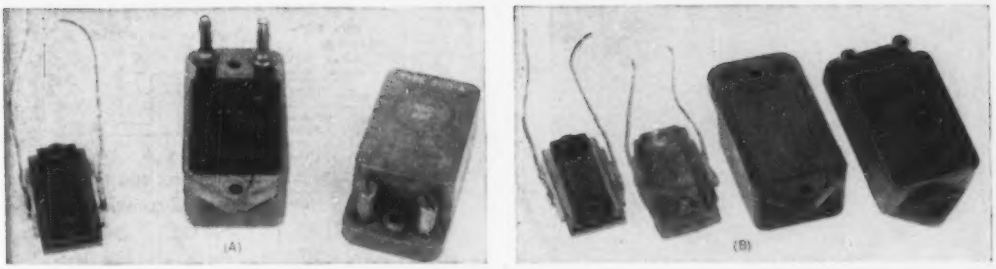


FIG. 4—Precision capacitor made by two methods, the case filled with silica gel, ground cork, paper and wax at (A), and dipped in wax and embedded in plastic within the case at (B)

consisting of 30 germanium diodes and associated components.

Two bleeder embedments are used in high-voltage cathode-ray tube power supplies. The embedments were made for Edgerton, Germeshausen and Grier. They consist of eleven 4-megohm, 2-watt resistors connected in series, with appropriate taps brought out. The bleeder has 22,000 volts applied across the end terminals and operates continuously with a current of 0.5 mil. The major advantages over conventional construction are space conservation, elimination of possible corona and mounting ease.

The Foxboro Company, manufacturer of precision industrial instruments, seals certain critical networks into metal cans. Figure 3 is a before-and-after photograph-series of one such network. At (A) and (B) is the former design. Components are rigidly mounted on a phenolic strip, the strip is mounted on the base of the metal can and is then wired to glass bead terminals which provide external connection.

This network has now been redesigned for embedment and is shown at (C) and (D). A reusable jig supports the terminal leads. The phenolic strip and glass beads are eliminated. The cover of the can serves as the mold for the resin.

Component Application

Applications for the embedment technique in the component field are indicated by the experience of General Radio. Early experiments indicated that components embedded within a relatively-thin plastic coating were impervious to 100-percent relative humidity under prolonged exposure. Moreover, the plastic coat presented a hydrophobic (non-wetting) surface to moisture. Plastic was superior to heavy wax coatings in physical properties. Electrical properties were satisfactory for some of the most exacting applications.

In Fig. 4A is a 100-$\mu\mu$f mica capacitor. It is made up of multiple layers of selected mica and foil. These are bound together by a brass clamp, with a heavy spring to give the proper degree of pressure preloading. Under standard procedure the component is next mounted in a low-loss phenolic case, surrounded by silica gel and ground cork, covered with paper and sealed with wax.

When applying embedment technique to this capacitor it was found that a light hydrocarbon wax-dip coating prevented liquid resin from entering the mica-foil pile and changing capacitance. A styrene-methacrylate molded case was chosen since the embedment plastic makes a perfect bond to this material. Experimental work produced a resin formulation and polymerization procedure which added a minimum and constant capacitance to the final product. A large number have been made up for testing under 100-percent relative-humidity conditions. After 1,000 hours no moisture had penetrated the capacitor shown in Fig. 4B.

Completely cast capacitors have been formed. One experimental model is in opaque and the other in clear plastic. Molding methods for this type of unit which would be practical on a production basis are now under investigation.

Plastic embedment of electronic parts is no longer untried. When the process is established and controlled by competent electrical and chemical engineers it is one of electronics' most useful design tools.

Table II—Properties of Typical Polyester-Type Embedment Resin *(Resin 40)*

(Polyester content—65%, Styrene content—35%)

Specific Gravity		1.24
Tensile Strength (psi)		9,000
Compressive Strength (psi)		19,000
Izod Impact, (ft-lb/ in. of notch)		0.3
Rockwell Hardness (M scale)		110
Coefficient of Linear Expansion (cm/cm/deg C		50×10^{-6}
ASTM Heat Distortion Under Load (deg C)		110
Thermal Conductivity (BTU/ft²/hr /deg F/in		1.5
Water Resistance (Gain 25 deg C, in 24 hr, in %		0.2
Dielectric Constant (at 60, at 1,000 and 10^6 cps)		3.1
Power Factor	60 cps	0.008
	1,000 cps	0.005
	10^6 cps	0.017
Dielectric Strength (v/mil, 100-mil sample)		500
Resistivity (ohm-cm)		10^{12}
Optical Properties		clear, water white when polymerized
Machineability		excellent

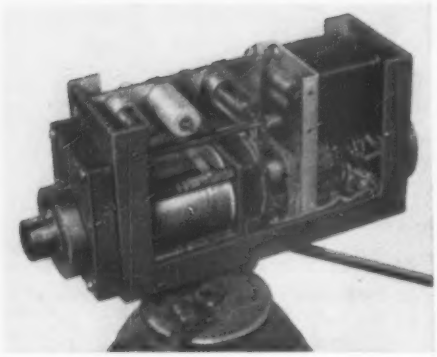


FIG. 1—Vidicon camera unit contains two miniature tubes and the picture tube

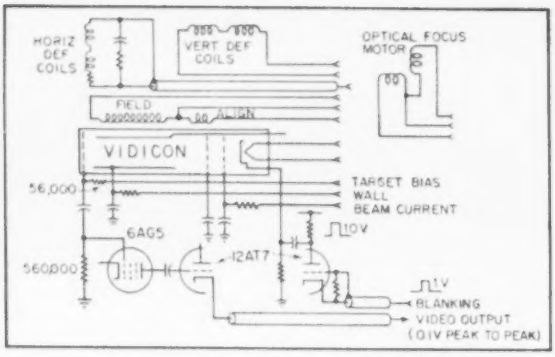


FIG. 2—A standard 24-conductor cable connects the camera and control units

Simplified TELEVISION

System uses recently introduced vidicon camera tube. Synchronizing signals follow RMA standards to allow use of commercial-broadcast tv receivers as monitors. Two units contain total of 43 tubes, including vidicon and monitoring scope

INDUSTRIAL television installations usually employ a multiplicity of camera units and a common centrally-located viewer, in contrast to broadcast television where a handful of cameras is used to serve many thousands of receivers. The most logical approach to cutting the cost of industrial television equipment is to reduce the cost of the camera units and to make them usable with commercial broadcast viewing equipment, which has already undergone substantial price reduction.

There are other basic requirements for industrial television equipment besides low cost. It should be compact and light in weight for portability. It should require a minimum of servicing and be capable of dependable operation over long periods of time.

Such a system is described here. A significant reduction in camera cost has been made possible by the recent introduction of the vidicon tube, which was described in ELECTRONICS last month.[1] The advantages of this photoconductive camera tube include operational simplicity, low cost, good resolution, freedom from spurious signals and high light sensitivity.

Vidicon System

The system consists of a small pickup camera and a master unit. These units are connected by a standard 24-conductor television camera cable, which may be up to 500 feet in length.

The camera shown in Fig. 1 with its cover removed is 10 inches long, $3^1/_4$ inches wide, 5 inches high, and weighs approximately 8 pounds. A typical 16-mm lens in a remote focusing mount permits optical focus adjustment by remote control from the front panel of the control unit along with the other camera adjustments.

The vidicon pickup tube can be seen extending inside of the focusing-coil—deflection-yoke assembly and the electron-gun alignment coil. The motor and gear assembly for operation of the remote focusing mechanism is located in the rear of the case and the video amplifier stages extend from the front of the camera toward the rear.

As shown in Fig. 2 the camera has been kept as simple as possible, containing only the pickup tube and those elements intimately connected with it. Scanning currents for both vertical and horizontal deflection coils are sent in over the cable along with the d-c currents for the focusing field and alignment coil as well as the operating potentials for various electrodes in the vidicon. A one-stage video preamplifier followed by a cathode-follower prepare the signals from the target electrode for transmission over the coaxial cable back to the master unit. In order to establish black level it is necessary to blank the target of the vidicon during the scanning return time and this is most conveniently done by applying a positive ten-volt blanking pulse to the cathode. Since a ten-volt pulse on a 52-ohm line represents a very sizeable current it was found more economical to transmit a one volt

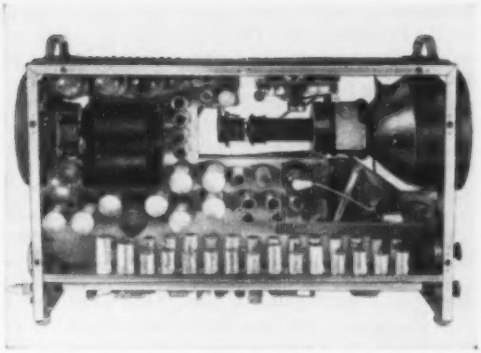


FIG 3—Left-side view of control unit shows video strip and cooling fan

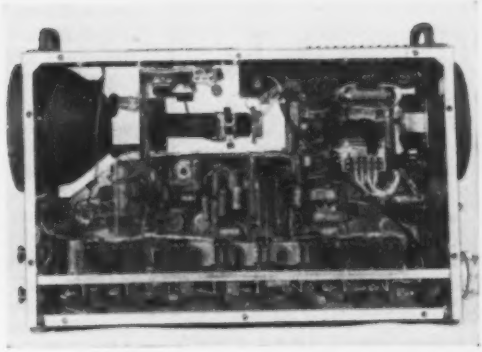
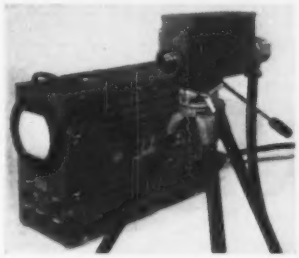


FIG. 4—Right-side view shows frequency-division chain and high-voltage circuits

For INDUSTRY



Complete industrial television system draws a total of 350 watts

By R. C. WEBB and J. M. MORGAN

Professor of Electrical Engineering, Iowa State College, Ames, Iowa

RCA Laboratories, Princeton, New Jersey

pulse and amplify it in the camera just before application to the vidicon cathode.

Views of each side of the master control unit are shown in Fig. 3 and 4.

In order to operate standard broadcast television receivers from a system of this kind it is necessary to establish substantially the same scanning rates as those used in commercial broadcasting. Certainly it is necessary to transmit an interlaced signal because otherwise the resolution in the vertical direction will drop to approximately 250 lines. It was therefore decided to establish the same scanning rates for the industrial system as those standardized by the RMA for commercial broadcasting, namely 525 lines, 30 frames interlaced.

Simplified Sync

One of the basic elements of the simplified synchronizing signal generator used in this equipment is an oscillator, which resembles the familiar multivibrator.[2]

This basic oscillator is illustrated in Fig. 5A. Before the plate voltage is applied to the circuit, C is uncharged and the grid of V_2 is at ground potential. As soon as plate voltage is applied, the grid of V_1 is raised to some positive potential determined by the series of resistors. The plate resistor of V_1 is low and consequently a relatively large current can be drawn by that tube down through the commoh cathode resistance, which raises the cathode of both of the tubes to some positive voltage E_K. With the cathode of V_2 highly positive with respect to its grid, the plate current in that tube is cut off and C is free to charge through R toward B+ according to the logarithmic curve shown in Fig. 5B.

If nothing were to prevent it, C would charge up to a value $(1 - 1/e)$ of B+ in RC seconds. However, as the potential on the grid of V_2 increases as C charges, it will reach the shaded region below E_K that represents the negative bias range for which V_2 will be conductive. As soon as V_2 begins to conduct, the plate current flowing through its plate resistor lowers the potential of the grid of V_1 and that tube is quickly biased off. However, since it was largely the heavy current drawn in the left-hand tube that supported the cathode potential at the value E_K, this potential will now drop to a very low value and the grid of V_2 will find itself highly positive with respect to its cathode. Capacitor C then discharges through the diode formed by the grid and cathode of V_2 and the length of time required for the discharge to occur is determined by the value of C and the effective resistance of the diode and the cathode resistor.

Having discharged C to a low value the circuit is ready to restart the cycle. Thus a saw-tooth voltage waveform is available across C and a narrow pulse can be obtained from the plate resistor of V_2. The exact frequency of oscillation of this circuit depends upon several factors including the value of the plate supply voltage, which is carefully regu-

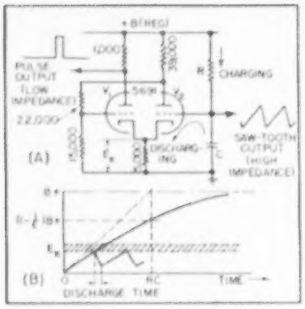


FIG. 5—Basic oscillator-counter operates at twice horizonal scanning frequency

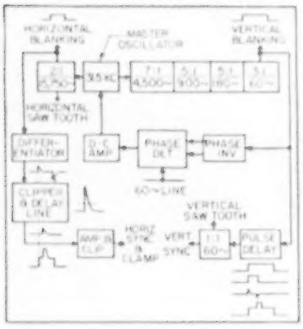


FIG. 6—Vertical and horizontal sync, scanning and blanking voltages are produced by this frequency-division and pulse-shaping network

lated. It depends primarily upon the values of R and C, and the voltage E_x, and it has been found to be stable enough over long periods of time for this application.

The oscillator is susceptible to being synchronized to external signals. A positive pulse added to the capacitor voltage can precipitate entry into the conduction region periodically, or a negative pulse added to E_x or to the left-hand grid will do as well. A circuit of this kind is especially useful in a television synchronizing generator since use can be made of the square-topped pulse output as well as the nearly ideal saw-tooth wave.

Frequency Division

The positive pulse out of the master oscillator is added to the capacitor voltage of the next stage below, which is an identical oscillator but set to run free at 1/7 or 1/5 the master frequency, as shown in Fig. 6. In this way the two oscillators are locked rigidly together and a third can be locked to the second and so on down to any submultiple frequency.

Seven of these oscillators are used in the synchronizing-signal generator. In order to obtain the half-integral relationship required between the horizontal and vertical scanning rates to produce odd-line interlacing, it is necessary to start with a master oscillator at 31.5 kc, which is double the horizontal rate of 15,750 cycles. Subdivision of the master frequency by the numbers 7, 5, 5 and 3 yields the vertical scanning rate of 60 cycles. The vertical blanking pulse is taken from the 60-cycle oscillator that is made to have a discharge time approximately 5 percent of the vertical period (V) by choice of the time constants governing that oscillator. A sample of the vertical blanking signal is taken through a phase inverter to a phase detector where it is compared to the power-line frequency. The afc signal thus developed is applied to the master oscillator to synchronize it with the power frequency.

The horizontal frequency generator is synchronized at ½ the master frequency and is adjusted to produce a horizontal blanking pulse width that is approximately 15 percent of the horizontal period. The saw-tooth output of this stage is also used as a scanning waveform.

Horizontal sync is made from blanking by differentiating the blanking pulse, clipping the leading pulse and sending it through a delay line to produce a front porch of about 2 percent of the horizontal scanning period H. The pulse is later amplified and clipped to produce a sync pulse with a steep front edge and a duration of approximately 5 percent H. The horizontal sync and blanking pulses are thus similar to the RMA standard waveforms.

The vertical sync pulse, which is quite unorthodox, is produced by allowing the front edge of vertical blanking to key a pulse delay tube into operation. After a time interval, determined by time constants in the delay circuit, the delay tube falls out of its conductive condition having produced a pulse that is a fraction of the length of the vertical blanking period.

This pulse is then differentiated, and the pip corresponding to the trailing edge of the delay pulse used to synchronize a second 60-cycle saw-tooth oscillator. The discharge time or equivalent pulse width from this oscillator is made to be no greater than approximately ⅛ of the time for one horizontal line in order that a short vertical sync pulse can be slipped in just ahead of one horizontal sync pulse and just after another one in the odd and even fields. Thus 10 tubes have been used to produce all of the waveforms required for the entire system.

The composite waveform is shown in Fig. 7. Although the vertical sync pulse is only about 10 times as long as the horizontal pulse no difficulty has been experienced in tests with commercial receivers in obtaining sufficient vertical sync signal. Furthermore, the signal in an industrial system is always noise free since it will be fed over closed circuits.

The scanning system used is shown in the block diagram of Fig. 8A. A single vertical deflection

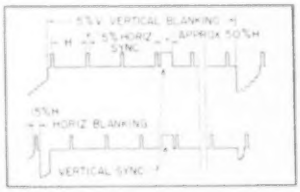


FIG. 7—Composite waveform for the industrial television system

amplifier is common to both the monitor kinescope and the camera since the power requirements are small and ordinary cable pairs are satisfactory for transmission out to the camera. The horizontal scanning and second anode voltage supply for the monitoring kinescope are combined in one conventional unit of the type normally used in home receivers.

The horizontal scanning for the camera is quite unconventional, however, since it is necesary to send the current to the camera through several hundred feet of 52-ohm coaxial cable. The method of accomplishing this can best be understood from Fig. 8B.

The parallel-resonant circuit comprising C and L with R_1 and R_2 connected serially in each arm is known to be antiresonant at all frequencies for the singular condition where $R_1 = R_2 = \sqrt{L/C}$. The terminal impedance Z, looking into the network is a pure resistance equal to $\sqrt{L/C}$ ohms at all frequencies. Such a constant resistance network as this makes an ideal termination for the transmission line and since it includes the horizontal deflection coil as one element it should be possible to produce any desired current waveform in the coil by impressing the proper voltage waveform upon the line. Ringing of the resonant circuit formed by the deflection coil and any capacitance that may be associated with it is very undesirable in the presence of the impulse waveforms used in television scanning. The condition for critical damping of a resonant circuit requires that the total resistance around the series loop must be at least equal to $2\sqrt{L/C}$, a condition that coincides exactly with the foregoing.

Synthesis of the required voltage waveform is accomplished as shown in Fig. 8C. The voltage across the inductance during the scanning period must be $L\,di/dt$ which for a constant rate of change of current is a small constant negative voltage. During retrace time the current change is in the opposite direction and many times faster, hence, the voltage required across the coil is of the form of a positive pulse. The voltage drop iR_1 across R_1 due to the saw-tooth current is of saw-tooth waveform as shown. The sum of these two voltages gives the required waveform that must be impressed upon the line to produce the ideal current saw-tooth in the coil.

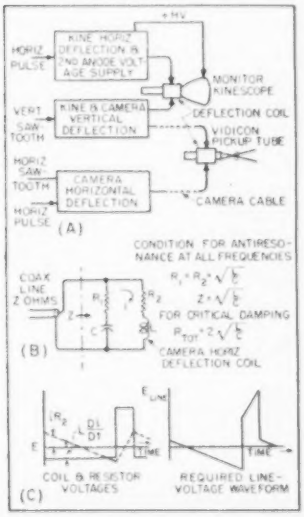


FIG. 8—Block diagram of scanning circuits. (B) and (C) explain operation

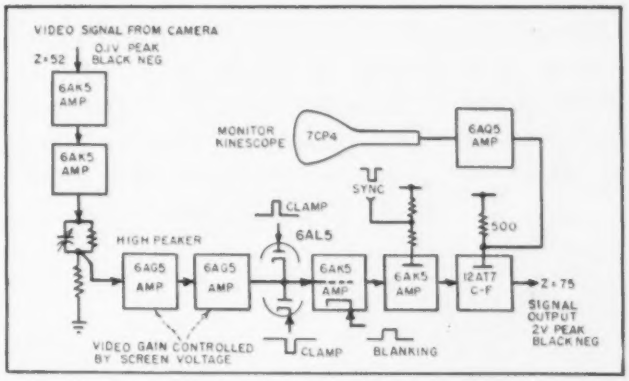


FIG. 9—Video path is similar to that used in broadcast transmitters

Perfection of the scanning linearity depends entirely upon the accuracy with which this complex waveform is produced. It was fortunate that both the saw-tooth waveform and its companion pulse were available from the horizontal frequency stage in the synchronizing-signal generator since it was then only necessary to mix the two waveforms with appropriate amplitude adjustment to obtain the required shape.

Video Amplifier

The video amplifier is almost identical to those used in broadcast equipment. As shown in Fig. 9, the signal goes through two stages of amplification before reaching the conventional high peaker.

Video gain is controlled by varying the screen voltage of the 6AG5's. Black level is established by means of a conventional driven clamp circuit; the clamping pulses are made from horizontal sync. Blanking is inserted in the cathode of the d-c setter and sync signals are mixed with video in the following stage. The composite signal is then sent to the external 75-ohm signal lines by means of a cathode-follower output stage. The output signal is polarized with blacks negative and is 2 volts peak to peak.

Signal for the internal kinescope is taken from a sampling resistor in the output stage and fed through a one-stage amplifier to the kinescope grid.

The gain in the kinescope loop is not adjustable and thus the kinescope serves as a rough monitor of the signal level on the outgoing line in addition to its other uses for black level setting, camera focus and beam adjustments, as well as a check on sync generator operation.

The television instrument described could easily be mass produced and sold within the price range of other business machines of comparable size and complexity. It will produce a sharp, steady picture of useful quality, and the pickup tube is sensitive enough to permit use of the equipment under the illumination levels normally encountered in industrial operations.

The authors are indebted to Dr. V. K. Zworykin of the RCA Laboratories for much helpful encouragement and guidance during the development of this project.

References

(1) Paul K. Weimer, Stanley V. Forgue and Robert R. Goodrich, The Vidicon—Photoconductive Camera Tube, ELECTRONICS, p 70, May 1950.

(2) Kurt Schlesinger, Patent No. 2,383,822 (RCA).

Highest fidelity, least noise and longest wear are obtained by using needles having different tip characteristics for slow-speed and for high-speed records. Convenience and less costly associated equipment, however, are creating considerable interest in compromise types, several of which are described here

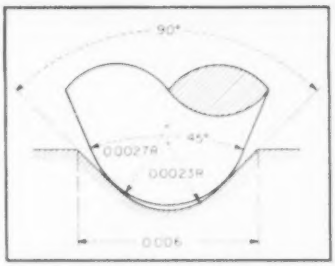


FIG. 1—Profile of typical 78-rpm groove and standard 2.7-mil radius needle

Contours of five types of needles in use today. (A) Standard 2.7-mil radius needle for 78-rpm discs. (B) All-purpose needle with 2-mil tip radius. (C) All-purpose Unipoint. (D) All-purpose wide-angle needle. (E) Standard 1-mil radius needle for fine-groove records

All-Purpose

By B. B. BAUER

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Chicago, Ill.

AMONG the problems confronting the designer of phonographs as a result of the introduction of 33⅓ and 45-rpm records is the need for separate needles for the 78-rpm and the slow-speed records. For best reproduction it is desirable to use a needle with a 2.7-mil tip radius (1 mil = 0.001 inch) for the 78.26-rpm records, and one with a 1-mil tip radius for the 33⅓ and 45-rpm records.

The requirement of employing dual-needle pickups, together with the mechanism for placing the proper needle in position, adds to the cost and complexity of the record player. It is not surprising, therefore, that work began on needles that would be capable of playing both the conventional and the fine-groove records when the latter were introduced by Columbia in the spring of 1948.

At this writing, a number of manufacturers are beginning to market phonograph players and record changers employing single-needle pickups for use with all records. In addition to eliminating the changing of needles, these players use the same low needle force of 7 to 10 grams for all types of records, resulting in further simplicity of operation. It is quite likely, therefore, that a substantial number of phonographs employing all-purpose needles will make their appearance in the near future. It is the purpose of this paper to review the performance of various commercially available all-purpose needles.

To begin the examination of the problem, it is well to review the relationship which exists between conventional phonograph grooves and needles. In Fig. 1 is shown in cross-section a typical groove and needle of a conventional 78-rpm record. The groove is 6 mils wide; it has a 2.3-mil bottom radius and sidewalls inclined at 45 deg.[1] The needle accepted as standard by the RMA has a 45 deg ± 5 deg included angle and a radius of 2.7 mils. The objective generally desired is to allow the needle to be supported by the sidewalls, rather than by the bottom of the groove, as in this manner the needle has a positive engagement with the groove and can be driven laterally without lost motion.

In Fig. 2 is shown in cross-section a typical groove and needle found in 33⅓ and 45-rpm records. Data issued by record manufacturers would indicate that the width of the grooves of 33⅓ rpm records should lie between the limits of 2.7 mils and 3.0 mils, and that of 45-rpm records between the limits of 2.5 and 3.0 mils. Measurements made by the writer and his associates on a number of fine-groove records selected at random indicate

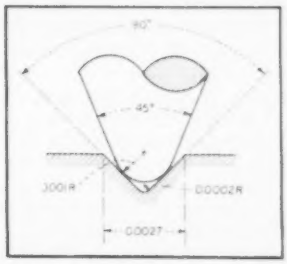

FIG. 2—Profile of typical fine-groove and standard 1-mil radius needle

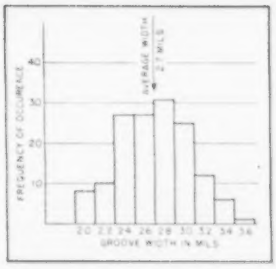

FIG. 3—Distribution of groove widths of 147 fine-groove records

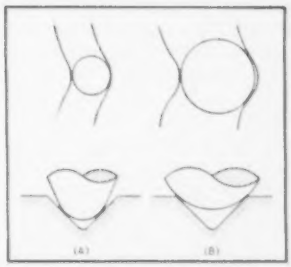

FIG. 4—(A) 1-mil radius needle in a modulated fine-groove. (B) 2-mil needle

PHONOGRAPH NEEDLES

that these limits are not being commercially maintained. The bar chart in Fig. 3 shows the distribution of groove widths of 147 fine-groove records of all types, selected at random. It is seen that, on the average, unmodulated fine-grooves have a width of 2.7 mils, and a substantial number of fine-groove records have unmodulated grooves only 2 mils wide. As a result of pinch effect, the modulated groove width is narrowed considerably, and upon occasion approaches 1.7 to 1.8 mils.

Performance Criteria

The evaluation of an all-purpose needle with respect to design problems and the satisfaction to the ultimate user constitute a complicated problem which does not have a single, simple solution.

An important factor to be considered is the quality of reproduction, which is intimately connected with freedom from distortion and surface noise. Low distortion depends upon the ability of a needle to trace a modulated groove accurately and it is determined in part by the radius of the needle at the point of contact with the record.[2] This can be seen from Fig. 4. This figure depicts two needles placed in a fine-groove, one of the needles having a radius of 1 mil and the other having a radius of 2 mils. The 1-mil needle is shown passing through the crest of a modulated wave having a radius of curvature somewhat larger than 1 mil. The 1-mil needle will follow this modulation without a discontinuity, as shown in Fig. 4A. A 2-mil needle placed in the same groove will hit a corner at the crest of the wave, causing a discontinuity accompanied by severe distortion. Therefore, one might conclude that for the best quality reproduction a needle should have the smallest possible radius.

On the other hand, there is also a low limit below which a needle radius cannot be diminished without causing another type of distortion known as skating. This effect is illustrated in Fig. 5. Here is shown a 1-mil radius needle placed in a 78-rpm groove. The needle is not properly supported and cannot be driven laterally in a positive manner. When playing a modulated groove, such a needle will skate from one sidewall to the other, resulting in distortion and a characteristic swishing type of surface noise.

Another factor which has a great deal of practical importance to the user of a phonograph is needle wear. A small needle point offers less contact area with the surface of the groove than does a large one, resulting in more rapid wear of the needle and the record. When a needle (which is initially a surface of revolution) develops sizeable flats because of wear the result is a substantial loss in fidelity, since the needle is no longer capable of faithfully following the groove modulations.[3] It is important to note that the reduction of needle force achieved with lightweight pickups for fine-groove records has been offset by smaller needle area in contact with the groove, and consequently the needle wear problem has not been lessened thereby.

In considering needle contour, one must be especially cautious of needles which are permitted to contact the upper edges, or corners, of the groove. These corners frequently have ridges (or horns)[4] which cause an increase in surface noise and popping noises when allowed to contact the playback tip. Also, after moderate playing time, the groove edges tend to wear shoulders in the surface of the needle, allowing it to rest partially on the land between the grooves. This results in a considerable increase in distortion. The effect can be minimized by keeping the needle force low and by using long-wear materials for the needle tip.

A third factor has become important as a direct consequence of lower needle forces employed with fine-groove records: the ability of a needle to pull the pickup across the record, that is, its traction, has become substantially lessened, often resulting in inability of the pickup to remain in the groove against the forces of pivot friction, side thrust, unbalanced gravity, or the drag of the trip mechanism of the record

changers. Traction force can be measured approximately by applying a lateral force to the side of the pickup (while playing a record) with a spring scale such as the Western Electric relay adjusting scale 70F until the needle is ejected from the groove. To cancel the effect of side thrust caused by tracking angle[1], it is necessary to perform this operation both inwardly and outwardly, and to average both readings. Pivot friction must be low to minimize frictional errors.

A small amount of mathematics will suffice to demonstrate that the traction force is equal to the vertical pickup force multiplied by the trigonometric tangent of the angle between the horizontal plane and the tangent line to the needle at the point of contact with the groove. Because of this factor, large-radius needles which rest upon the upper edges of the groove exhibit greatly lowered traction when they are new as compared to small-radius needles.

With these considerations in mind, we may proceed to examine some of the all-purpose needles commercially available at this time.

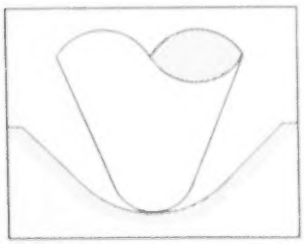

FIG. 5—Profile of 1 mil needle placed in a 78 rpm groove

Spherical-Tip Type

One of the earliest all-purpose needles to which consideration was given had a spherical point and a radius selected to lie between the standard 1-mil and 2.7-mil radii. A large amount of experimental work was done in the Shure laboratories to ascertain the most favorable size of spherical-tip needle for all-purpose use. These tests indicated that sufficiently satisfactory performance for many applications is obtained with a needle having a radius maintained closely at 2 mils.

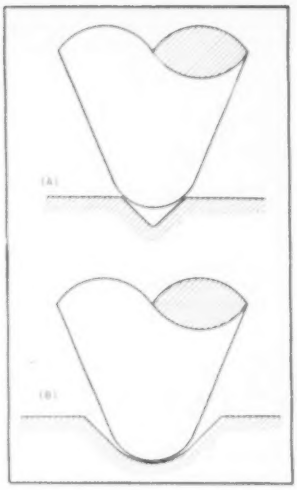

FIG. 6—(A) Profile of 2-mil radius needle in a fine groove. (B) Profile of needle in 78-rpm groove

The manner in which this type of needle fits into the two types of grooves is shown in Fig. 6. In the case of a typical fine groove, the needle contacts the upper edges of the groove as seen in Fig. 6A. Because these edges are apt to be damaged by scratching or scuffing, and because of horns, a 2-mil radius needle reproduces more surface noise than a standard 1-mil radius needle especially designed for use in fine grooves. A 2-mil needle will cause an increase in distortion in fine-groove records because of the relatively large radius in contact with the modulated groove. This fact becomes especially noticeable on highly modulated inside grooves of 33⅓ rpm records. Likewise, the wear of 2-mil needles on fine-groove records is considerable. Figure 7 shows a photograph of a 2-mil osmium-tip needle which had been played 21 hours on Columbia microgroove records. Under the conditions of test, the shoulders produced by the groove edge allow the needle to rest upon the land, resulting in noticeable distortion. A similar needle having a sapphire tip will last several times as long as the osmium-tip needle before reaching this condition.

Traction of 2-mil needles on fine-groove records is initially rather low, ranging from approximately 50 percent to 70 percent of needle force (depending upon the exact needle radius and width of the groove). It follows, therefore, that the mechanics of pickup and changer have to be carefully determined to insure reliable operation.

From Fig. 6B, it is seen that in a typical 78-rpm groove, the 2-mil-radius needle rides at, or close to, the bottom of the groove. In actual practice the needle tip presses into the bottom of the groove under the influence of the pickup force, and therefore it exhibits fairly satisfactory engagement with the modulated sidewall. The bottom portion of the groove impresses a greater amount of noise upon a laterally responsive pickup than does the sidewall, resulting in increased surface noise from shellac records. In the instances of records with grooves having large bottom radius, skating is often clearly discernible.

On first thought, it might appear that a needle of this type would not provide satisfactory reproduction. Fortunately, distortion and noise which might be extremely annoying in a wide-range system often become tolerable in a system with a high-frequency cut-off beginning at 3 to 4 kc. It is a well-established fact that the majority of non-technical listeners will accept a substantial attenuation of high-frequency response in order to achieve a comparative freedom from distortion and surface noise.[2] This object is accomplished in our P81 pickup cartridge, which has been especially designed for use with all-purpose needles, and which has been found

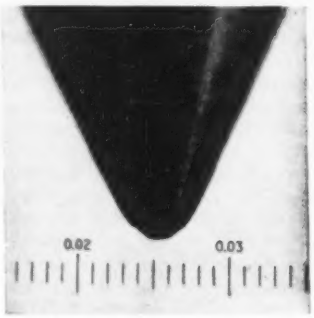

FIG. 7—Photograph of a 2-mil osmium all-purpose needle after 21 hours of wear on fine-groove records

well suited for use in the home. The frequency response characteristic of this cartridge is shown in Fig. 8.

The Unipoint Needle

A considerable amount of experimental work has been performed on a special needle having generally conical sidewalls and a truncated tip. This needle has been named the "Unipoint." A typical outline of the needle in relation to the average 78-rpm groove and the average fine groove is shown in Fig. 9. The engagement of the needle with the average fine groove is shown in Fig. 9A. The needle rides well within the groove and is in contact with the sidewalls, therefore traction is good and noise is low. However, because the radius at the point of contact is greater than that of a 1-mil radius needle, this needle produces greater distortion than a standard 1-mil needle (but less than a 2-mil needle). The profile after 43 hours of wear is shown in Fig. 10. Because of the absence of shoulders, the needle illustrated will still perform tolerably well on fine-groove records, but will exhibit noise and skating on 78-rpm records. A sapphire type will last several times as long as an osmium type.

It is seen in Fig. 9B that the needle is in contact with the sidewalls of the standard groove close to the bottom of the groove. Therefore, an increase in surface noise is inevitable as compared to a standard 2.7-mil spherical point. However, the two-point contact helps to promote a more positive driving by the sidewalls, especially when the needle presses into the groove as a result of vertical pickup force. On some records where a 2-mil needle exhibited noticeable skating, very little skating was perceived with a Unipoint.

There is considerable evidence that the needle offers advantages over a 2-mil radius needle, especially to the user principally concerned with the playing of fine-groove records. These advantages are offset by certain disadvantages. Because of its more complicated contour, the needle is not easy to control in production with regard to dimensions. Also, one which is played constantly on fine-groove records becomes less satisfactory with time for use on 78-rpm discs. (The same is also true of 2-mil radius needles, but to a lesser degree.) One may generalize by saying that a 2-mil needle favors 78-rpm records, while the Unipoint favors fine-groove records.

Wide-Angle Needle

Early cutoff at high frequency is needed when employing a Unipoint needle with 78-rpm records, but it is not essential when playing fine-groove records. Satisfactory cutoff may be obtained with an R-C network connected as shown in Fig. 11. The switching circuit for inserting the network for the 78-rpm records may be mechanically coupled to the speed-changing lever of the record changer. In Fig. 11 is shown the frequency response characteristic of our P71 extended-range pickup employing the new needle, with and without the network.

Still another form of all-purpose needle was described by J. Reid of the Crosley Corporation at the May, 1949 meeting of the Acoustical Society of America. This needle is shown in profile in Fig. 12, together with the outlines of 78-rpm and fine grooves. Basically it consists of a cone having an included angle of approximately 108 deg to 118 deg and a bottom radius of approximately 1.6 mils. The intention is to choose an angle and tip radius large enough to avoid touching the bottom of 78-rpm grooves. If these conditions are met, the needle is capable of fitting the groove by remaining in contact with the upper edges of grooves of all sizes.

Because of the large radius at

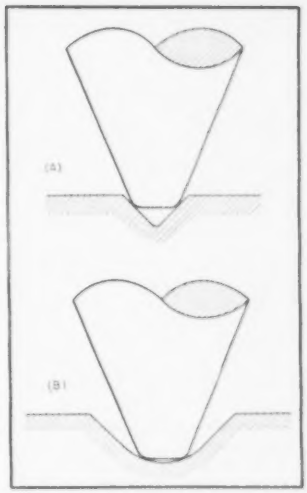

FIG. 9—(A) Profile of Unipoint needle in a fine groove. (B) Profile of needle in a 78-rpm groove

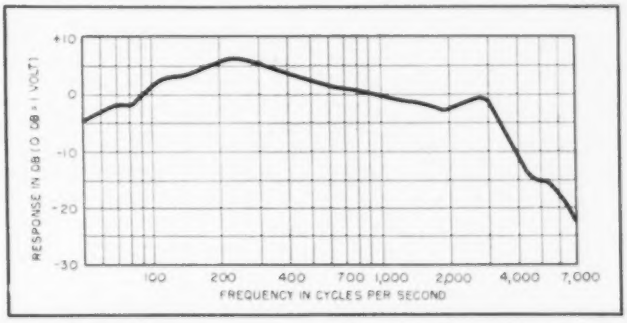

FIG. 8—Response-frequency characteristic of Shure P81 pickup cartridge terminated with 1 megohm, with all-purpose 2-mil radius needle on Auditone record. High-frequency response is attenuated by means of an internal mechanical filter

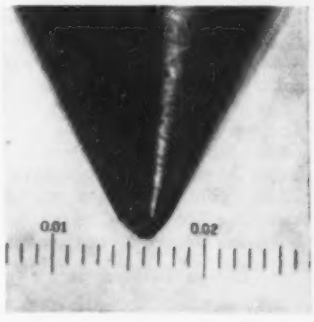

FIG. 10—Photograph of osmium Unipoint needle after 43 hours of wear on fine-groove records

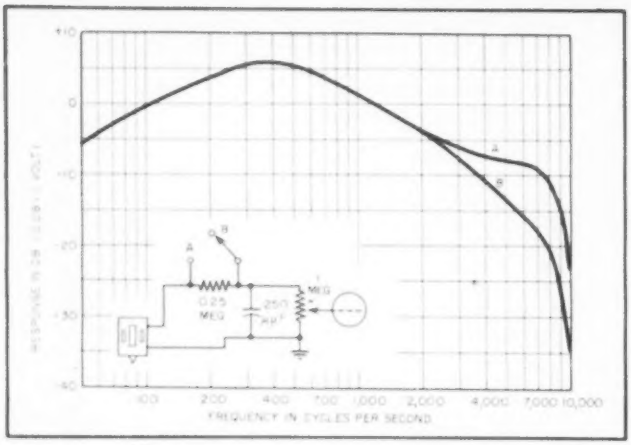

FIG. 11—Switching circuit for selecting (A) extended frequency range, or (B) early cutoff when using a pickup with a Unipoint needle on fine-groove records and 78-rpm records respectively. Response-frequency characteristic measured on RCA 12-5-31 record

the point of contact with the groove, the tracing distortion is increased, although the effect of this distortion may be diminished on both 78-rpm and fine-groove records by curtailing the upper frequency range of sound reproduction, as with previous needles. Again, attenuation of highs helps to eliminate noise residing at groove edges caused by horns and scuffed records. The advantages claimed by Mr. Reid for this needle are the same as those claimed for the large-radius needle described some years ago[7].

Because of the wide angle, the traction ability of the needle is diminished. This necessitates reasonable care in the design and adjustment of the tripping mechanism for reliable operation of record changers. Likewise, the ability of the needle to follow the groove modulation is somewhat lessened, necessitating the use of somewhat higher compliance in pickups, or conversely, a greater needle force for proper operation.

Wear data is not available on this needle; however, information furnished by Mr. Reid indicates it has a long life and is rugged and not easily damaged by careless use.

Design Orientation

Listeners' satisfaction with all-purpose needles is subject to such a degree of variation that definitive conclusions cannot be drawn at the present time to cover all conditions. However, a number of generalized conclusions can be stated.

In instruments capable of high-quality, wide-range reproduction, all-purpose needles offer less fidelity and less listener satisfaction than do the standard 1-mil and 2.7-mil needles. The use of all-purpose needles results in an increase in distortion and surface noise. As stated previously, these effects may be rendered less perceptible by attenuating the high-frequency response of the system. As a general rule, therefore, users of all-purpose needles have found it expedient to employ reproducing systems which have a significant attenuation in the frequency range above aproximately 2½ to 4 kc. This type of response characteristic does not permit taking advantage of the very best quality of reproduction available from fine-groove records; the advantage of simplicity and low cost which is gained, however, is often considered sufficient to warrant the use of such needles in the home. Because the majority of all-purpose pickups have a replaceable needle, the user can readily substitute in its place one of the standard needles if he chooses to build a library of 78-rpm or slow-speed records only.

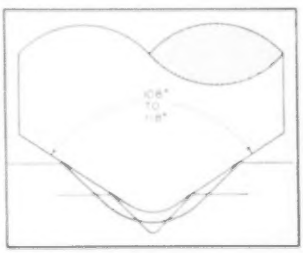

FIG. 12—Wide-angle needle shown with the outlines of a 78-rpm groove and a fine groove

Since the performance of all-purpose needles is greatly impaired by wear, it is desirable to specify the longest-life tip material available, consistent with cost limitations. The best long-wear metal tips presently available for all-purpose needles are probably useful for 20 to 50 hours of wear—depending upon numerous conditions, including listener's tolerance. Sapphire tips should generally last three to four times longer. All of the wear tests previously mentioned were performed with a vertical needle force equivalent to 7 grams (¼ ounce) upon the record. All-purpose needles should be employed with the lightest-weight pickups only, and certainly not with needle forces equivalent to more than 10 to 12 grams.

In choosing a pickup and needle system for multi-purpose phonographs, the designer must weigh the elements of fidelity, convenience and cost of the pickup, as well as that of the associated tone arm, record changer, and circuit. The choice of system will further depend upon the buying habits and preferences of the potential group of customers.

References

(1) The dimensions of the so-called standard groove have not yet been standardized by the Radio Manufacturers Association. The dimensions given represent the current concensus regarding groove dimensions.

(2) J. A. Pierce and F. V. Hunt, On Distortion in Sound Reproduction from Phonograph Records, *Journal of the Acoustical Society of America*, **10**, p 14, 1938.

(3) B. B. Bauer, Notes on Distortion in Phonograph Reproduction Caused by Needle Wear, *Journal of the Acoustical Society of America*, **16**, p 246, 1945.

(4) Isabel L. Capps, Recording Styli, *Electronic Industries*, Nov., 1946.

(5) B. B. Bauer, Tracking Angle in Phonograph Pickups, ELECTRONICS, March, 1945.

(6) B. B. Bauer, Crystal Pickup Compensation Circuits, ELECTRONICS, Nov., 1945.

(7) John D. Reid, A Large Radius Stylus for the Reproduction of Lateral Cut Phonograph Records, *Journal of the Acoustical Society of America*, **13**, p 274, Jan. 1942.

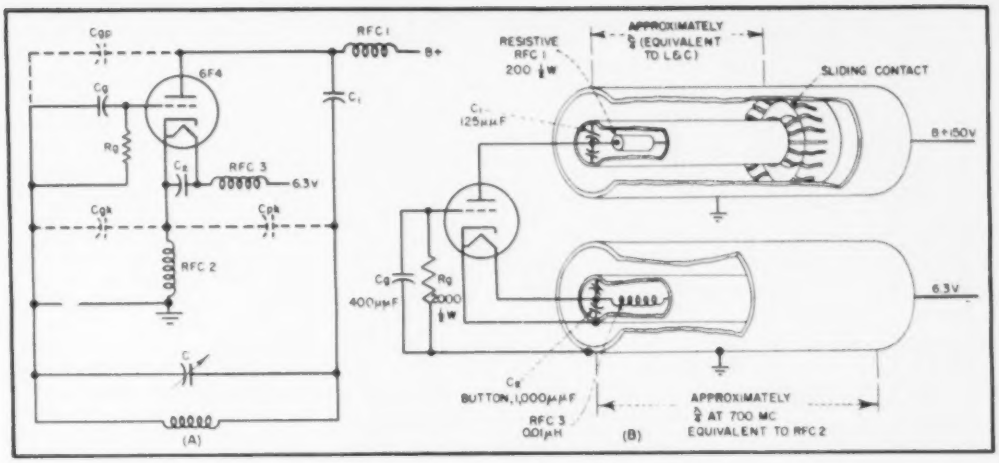

FIG. 1—Basic oscillator circuit and coaxial-line equivalent

UHF Sweep-Frequency Oscillator

Measurements and tests in the proposed new uhf television band are facilitated by the equipment described. Maximum sweep of 30 mc from 470 to 890 mc, at a rate synchronized with the power line, is provided by a motor-driven capacitor plate rotated at the high-impedance end of a resonant cavity

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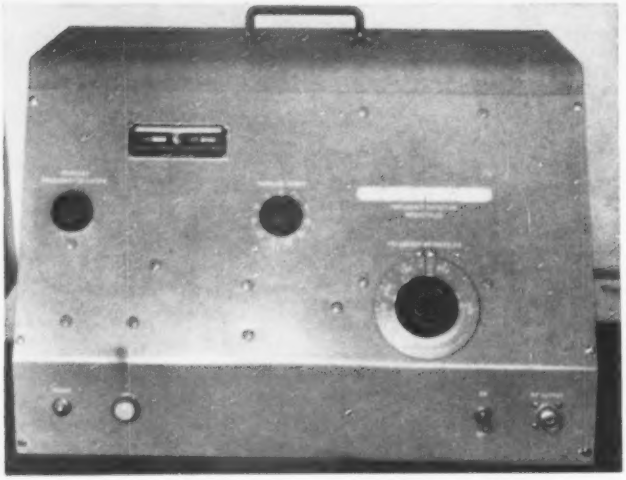
IN DEVELOPING a sweep oscillator for the new uhf television band, a choice exists in attempting to frequency-modulate a fundamental oscillator directly or to resort to a mixing method involving either the frequency addition of two lower-frequency oscillators or subtraction of two higher-frequency oscillators.

An output of the order of several volts across 50 ohms is available using a 6F4 triode as a fundamental oscillator, whereas any simple mixing method using two oscillator tubes will result in a maximum output about 10 to 20 db down from this level. The larger output of the fundamental-frequency oscillator is useful in many applications. Since the use of a swept fundamental-frequency oscillator offers much greater ease and simplicity of operation and greater freedom from harmonic output, this type of oscillator is more desirable provided the problem of obtaining satisfactory frequency sweeping does not become too complex.

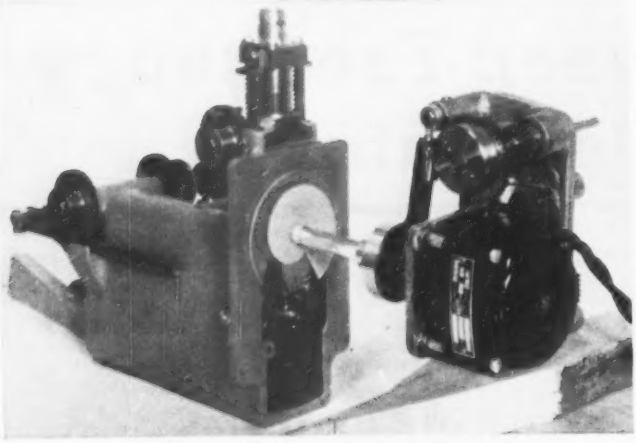
The sweep oscillator to be described covers a range from 470 to 890 mc with a maximum sweep of at least 30 mc at a rate synchronized with the power line. At least 2 volts across 50 ohms is available at any frequency within the specified band, and this voltage can be continuously attenuated by a front panel control to a value of 90 decibels below the maximum output.

At any fixed setting of the attenuator, the output does not vary by more than 1.5 db from the average output at that setting over the entire specified frequency band. Leakage from the oscillator has been minimized by use of completely enclosed coaxial line circuits.

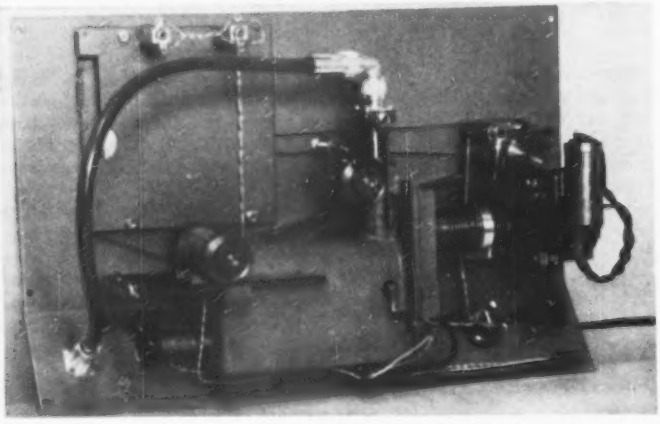
The modified Colpitts oscillator circuit shown in Fig. 1A was selected as best suited for the pur-



Magnitude of the frequency sweep is shown automatically through a panel slot as the oscillator frequency is varied



Closeup of specially shaped capacitor and its motor drive system



A standard rack-and-pinion drive is used on both tuning plunger and attenuator

pose in this television application.

Resonance is obtained between the plate and grid of the 6F4 acorn triode while the plate-to-cathode and grid-to-cathode interelectrode capacitances form a well-proportioned capacitive voltage-dividing network to complete the Colpitts arrangement. Both the cathode and filament circuits are choked to minimize their shunting effect across the grid-to-cathode interelectrode capacitance.

Since adequate shielding is of great importance, the oscillator was constructed in a self-shielding coaxial line. A coaxial line equivalent of the basic oscillator circuit is shown schematically in Fig. 1B.

A cutaway view showing the mechanical construction of the coaxial line oscillator is shown in Fig. 2.

The main body of the oscillator is made from a single bronze casting. The glass body of the oscillator tube is recessed in an indentation in the center conductor to provide a low-impedance connecting line between the resonant circuit and the tube elements. This low-impedance connecting line is necessary to obtain a satisfactory tuning rate at the high-frequency end of the band.

The coaxial-line section used to choke the filament is chosen in length to offer maximum impedance at the center-band frequency. Sufficiently high impedance is obtained at the band edges to give good performance.

Output power is capacitively coupled from the oscillator tank cir-

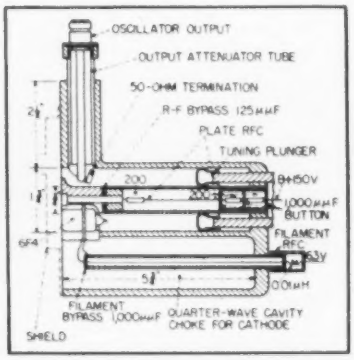


Fig. 2—Physical construction of coaxial-line oscillator

cuit through a coaxial line connected close to the high-voltage point of the resonator as shown in Fig. 2. The harmonic content at this point is small. The output line is terminated in a 50-ohm resistor to provide a reasonably well matched output impedance.

The output is attenuated by withdrawing the pickup line from the axis of the resonant cavity. As the center conductor of the output line is withdrawn the coupling is obtained through the intervening section of tubing which acts as a circular waveguide operated below its cutoff frequency.

The rate of attenuation through a waveguide used under these conditions is almost linear and constant over a wide range of frequencies which makes it possible to have a calibrated attenuator control. Typical power output characteristics for the oscillator are shown in Fig. 3.

Mechanism for Sweeping

Frequency sweeping is accomplished by varying the capacitance between the high-impedance end of the cavity and ground. There are a number of ways of varying this capacitance but the two most straightforward approaches consist of either vibrating a metallic strip in reed-like fashion against the end of the cavity or employing a motor drive to vary the capacitance by rotating a specially shaped capacitor plate. In either case, the motions have to be synchronized with some convenient standard such as the 60-cycle line so that a stationary picture can be obtained on a viewing oscilloscope.

The vibrating capacitor presents certain problems that involve difficult electronic or electromechanical solutions. A driven reed has a motion that includes harmonic components of the driving frequency. A reed driven by a sine-wave power source should be viewed on an oscilloscope with a sine-wave sweep to preserve the frequency linearity of the base line. A sine sweep, however, requires perfect synchronism so that the return trace may exactly coincide with the forward trace. The presence of mechanical harmonics prevents this.

This problem can be circumvented by electronic means. The reed could be driven with a sawtooth wave form and the return portion of the sine sweep could be blanked, but a solution for the second or rotating approach is simple and direct.

One photograph shows the mechanical arrangement used for the rotational method of sweeping the frequency. A synchronous motor is used to rotate a specially shaped capacitor plate which is sprayed on the face of a plastic disc. The ideal shape of the capacitor plate when a sawtooth sweep is used on the oscilloscope is one that will allow the frequency of the oscillator to vary linearly with angular rotation of the driving motor. The magnitude of the sweep is varied by changing the spacing between the plate and the end of the resonator.

The sweep capacitor spacing is controlled by the angular rotation of an eccentrically mounted circular cam. The cam follower is spring loaded and the front panel control is coupled to the cam through a conventional gear train having a 4 to 1 rotational ratio. This ratio is desirable since the entire cam throw occurs in only 180 degrees of rotation.

The synchronous motor used has the property of locking in on any one of four points on the cycle of the input 60-cycle power source. Phasing between the similarly locked internal sawtooth sweep on the viewing oscilloscope and the rotating motor can be roughly adjusted to any one of the four motor positions by momentarily breaking the motor circuit and allowing the motor armature to slip one position. Fine adjustment in phase is made with controls on the oscilloscope.

Dial Details

A curve of the sweep characteristics of the complete oscillator is shown in Fig. 4. This shows that the magnitude of the frequency sweep for a given capacitor plate spacing is not constant over the frequency range. This is corrected through the use of a dial arrangement which automatically shows the magnitude of the frequency sweep as the frequency is varied.

To accomplish this, the dial consists of a chart on which is plotted curves for constant frequency sweep with the tuning plunger position as the ordinate and the angular knob movement, which controls the capacitor spacing, as the abscissa. This chart is viewed through a slot in the panel and is arranged to move past this slot as the oscillator frequency is varied.

A pointer travelling along the slot is mechanically connected to the sweep capacitor. The chart is drawn so that the end of this pointer indicates directly the magnitude of the frequency sweep at any oscillator frequency and at any capacitor plate setting.

Two simple cord and pulley systems are used to drive the pointer and chart in the frequency sweep indicating system. The pointer is connected to the sweep magnitude control and the chart position is coupled to the tuning plunger position.

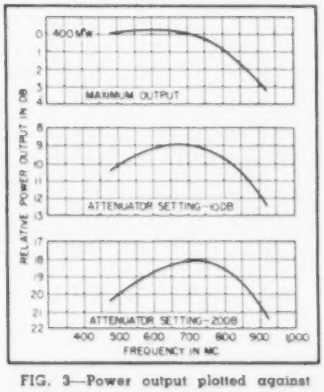


FIG. 3—Power output plotted against frequency for several attenuator settings

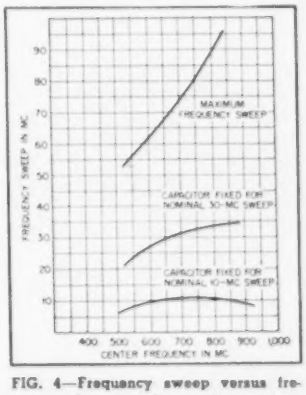

MAXIMUM FREQUENCY SWEEP
CAPACITOR FIXED FOR NOMINAL 30-MC SWEEP
CAPACITOR FIXED FOR NOMINAL 10-MC SWEEP
FREQUENCY SWEEP IN MC
400 500 600 700 800 900 1000
CENTER FREQUENCY IN MC

FIG. 4—Frequency sweep versus frequency for several capacitor settings

VHF LINKS at Manila

Line-of-sight f-m links in 160-mc band provide over 150 speech, telegraph, printer and control circuits between new CAA control station and remote transmitting and receiving stations. Details of special circuits are given

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AT MANILA INTERNATIONAL AIRPORT, formerly Nichols Field, CAA has designed and is finishing construction of one of the world's most extensive and complete aeronautical communications networks.

From Manila point-to-point and air-ground communications circuits radiate toward Australia, Java, Malay States, French Indo-China, Japan, and the United States. In addition, interisland radio printer and c-w circuits connect Manila with numerous island cities for dissemination of aeronautical and weather information.

For a number of years CAA has been studying the relative dependability and cost of wire-line and radio-control links between the control stations and antenna sites at its overseas communications stations. In the Philippines, new factors affected the design of the control links. Permanent wire-line facilities in the Manila area were largely devastated during the war, and the risk of service breakdown through landline pilferage made still another strong argument for the use of radio to connect remotely located transmitting and receiving stations with the master control station at the airport.

Circuit Requirements

The types of control circuits required at Manila are similar to those of all CAA overseas communications stations. Remotely located radio transmitters and receivers must be controllable from the airport to maintain communication with aircraft in flight and with other overseas aeronautical terminals. Weather information must be gathered and disseminated to aircraft in flight as well as to many fixed points in the area. Information necessary to the operation of the many airlines concerned must be exchanged over six point-to-point radio printer and telegraph circuits out of Manila.

Communication to aircraft in flight uses both c-w telegraph and radiotelephone. Multichannel transmitters and tunable receivers are used. For control circuits pertaining to air-ground communication, circuits are arranged so the operator can make a dial selection of the transmitter frequency desired at any one of seven remote air-ground operating positions. In addition, the operator is provided with control circuits enabling him to voice-modulate or manually key the transmitters. These control functions

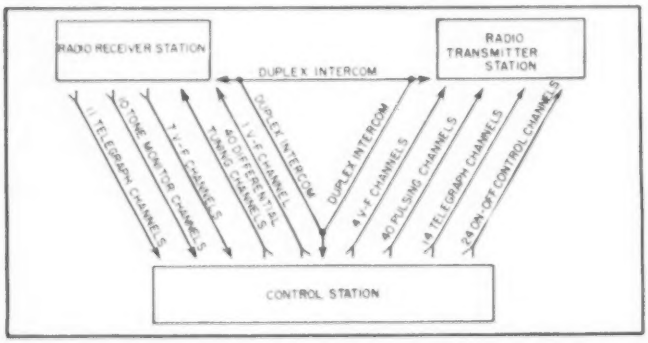


FIG. 1—Each arrow represents one of the vhf links used in lieu of wire lines between control station at airport and the two remotely located antenna sites. Numbers and types of carrier-derived channels provided by each link are indicated

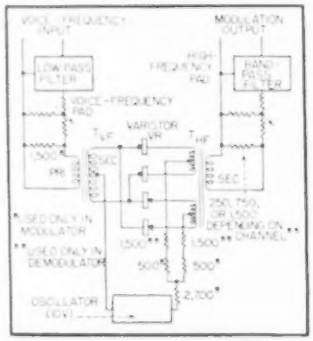
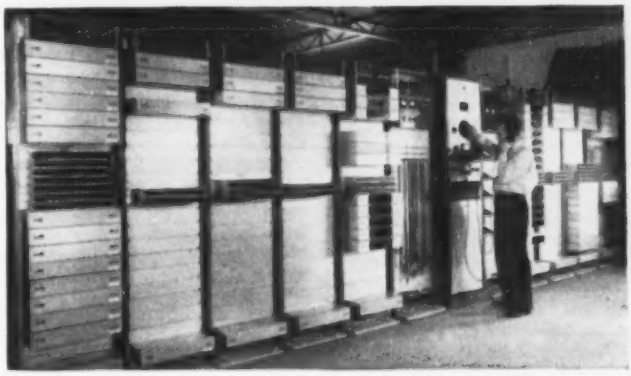


FIG. 2—Basic modem circuit that can be used either as a modulator for producing sidebands or as a demodulator

Airport

Demonstrating Lenkurt equipment to group of Philippine trainees for operating and maintenance duties at Manila CAA installations



Carrier equipment racks for control station of aeronautical communications network

are obtained through carrier-derived voice channels. An associated tone-channeling system is used to apply power to the remote transmitters, to deliver transmitter dialing impulses, and to allow manual keying with semiautomatic telegraph keys.

When receiving transmissions from aircraft in flight, the audio output of the remote receivers is transmitted over vhf carrier-derived voice channels which pass frequencies in the range of 200 to 2,800 cps. For the c-w output of receivers, a much wider bandwidth must be transmitted so that the operator can receive transmissions from aircraft whose transmitters are slightly off frequency.

A monitoring-modulator control circuit is included to permit simultaneous monitoring of all signals in the output of a communications receiver with a bandwidth of 16 kc and selection of the particular signal required. Control of the beat-frequency oscillator and r-f sensitivity is secured with small reversible motors attached to the receivers. Angular position of the remote shaft is indicated to the operator.

Carrier Equipment

Point-to-point radio communication is carried over both manual radiotelegraph and frequency-shift radio printer circuits. For printer signals the control circuits provide tone channeling on carrier-derived voice channels which transmit 75 or 150-wpm impulses between stations. Radio circuits are for duplex, duplex-diplex, and simplex operation. Thirteen operating positions are devoted to point-to-point, weather, and auxiliary printer services.

Control and speech signals are transmitted over line-of-sight distances between radio transmitter and receiver stations and the control station by vhf f-m radio links operating in the 160-mc band. The channels provided by each link are indicated in Fig. 1. The usable modulation frequency range of each vhf link is 300 to 28,000 cps, with a r-f power output of 10 watts. Corner reflector antennas are used.

The control station is in its own building at the airport, with wire connections to the airport control tower. The other two stations are in their own buildings at separate remote sites chosen for optimum antenna effectiveness.

Operation of the carrier equipment associated with each radio link is essentially the same for all links. A low-pass high-pass filter divides the 300 to 28,000-cps modulation band of the radio link into two bands—300 to 3,000 and 4,000 to 28,000 cps. The lower band is used directly for transmission of voice frequencies. The upper band is for derivation of six carrier voice channels which can be used for speech, voice-frequency signaling, or voice-frequency telegraph.

Modulator-demodulators or modems, when used as modulators, combine modulating and limiting actions on the carrier voice-frequency channels. The same equipment panel can be used as a demod-

ulator. This equipment, when combined with a suitable oscillator, modulates a 0 to 3,000-cps voice band to produce one of these sidebands: 5 to 8 kc—channel 2; 9 to 12 kc—channel 3; 13 to 16 kc—channel 4; 17 to 20 kc—channel 5; 21 to 24 kc—channel 6; 25 to 28 kc—channel 7. For future expansion of the system, additional sidebands as high as 45 to 48 kc can be produced.

The basic modem circuit is shown in Fig. 2. Following a low-pass filter and an attenuation pad, the voice-frequency signal is impressed on one winding of transformer T_{VF}. Oscillator voltage is applied between the midpoint of the other winding and the paralleled midpoints of two windings of transformer T_{RF}.

The carrier-frequency (oscillator) voltage exceeds the voice-frequency voltage in T_{VF} to such an extent that the carrier voltage always controls the polarity of the combined voltage across varistor VR. The audio voltage merely increases or decreases the instantaneous magnitude of the carrier voltage at the audio frequency. When polarity of the carrier voltage is such that T_{VF} is positive with respect to T_{RF}, current flows through VR and through both transformers, with the secondary of T_{VF} in series with one primary of T_{RF}. When carrier voltage reverses, current flows through the secondary of T_{VF} in series with the other primary of T_{RF}. Thus VR acts as a switch to reverse the T_{VF} windings at the carrier frequency. In doing this the oscillator current divides at the center tap and flows in opposite directions through the two halves of each winding of T_{RF}.

Traffic control tower at Manila International Airport, near control station

The direction of balanced current flow through the transformer windings is controlled by the oscillator, while variation in the amount of unbalanced current flow is controlled by the voice-frequency signal. These unbalanced variations in T_{RF} induce sideband frequencies in the opposite winding in a manner identical to the means of deriving upper and lower sidebands from a conventional balanced modulator circuit utilizing electron tubes. These sideband frequencies are attenuated to proper level in the high-frequency pad and applied to the bandpass filter, through which only the lower sideband passes to the modulation output terminals. This modem output is parallel-connected to other modems and to the high-pass side of a line filter.

In service as a demodulator, the action described above is reversed, with the result that voice frequencies are produced from a carrier-frequency sideband.

Signaling Equipment

All signal pulsing up to 30 cps, except telegraphy, is handled from the sending end by a universal signal transmitter that can provide signaling pulses on either an on-off or differential-level basis under control of an external pulse circuit. One type of transmitter has nine units for 18 signal circuits spaced 120 cps between 420 and 2,460 cps, capable of 14 pps. Another transmitter has four units for eight circuits at 240-cps spacing from 780 to 2,460 cps, at 28 pps.

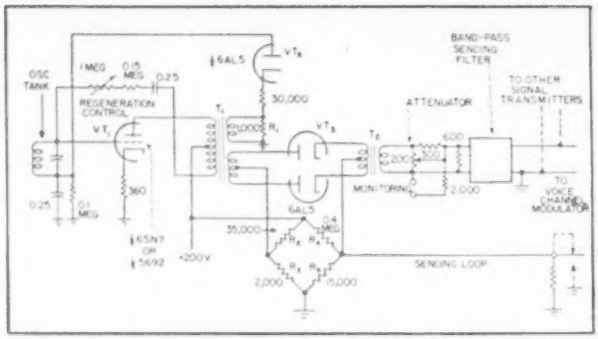


FIG. 3—Typical universal signal transmitter circuit. In use these are paired to utilize the other sections of the first two tubes

A typical signal transmitter circuit is shown in Fig. 3. One section of dual triode VT_1 functions in a stabilized oscillator circuit at the signal frequency. Adjustable regeneration is fed back to the grid from one half of the primary of the oscillator output transformer T_1 to provide for oscillator level variation.

Diode VT_2 contributes a rectified negative voltage from the oscillator output as a portion of the oscillator grid bias, thus opposing any change in oscillator output. Another output-stability measure is resistor R_1, which loads the oscillator enough to dissipate several times the power of the used signal. Thus the change in oscillator loading produced by keying represents only a fraction of the total load.

The portion of oscillator output used for signaling is fed in a balanced circuit to the plates of dual-diode VT_3. Conduction through VT_3 depends on its cathode bias, which is under control of the local sending loop. Plate and cathode d-c voltages are obtained from voltage-divider networks formed by R_2 and R_3 for the plates and R_4 and R_5 for the cathodes. These are proportioned so VT_3 is normally nonconducting. Shorting R_5 to ground through the sending loop makes VT_3 continuously conducting. Grounding R_5 through various amounts of resistance in the sending loop makes VT_3 conductive for various intermediate portions of each cycle. The effect is to make the output vary in level. When VT_3 is conducting, signal from the oscillator passes

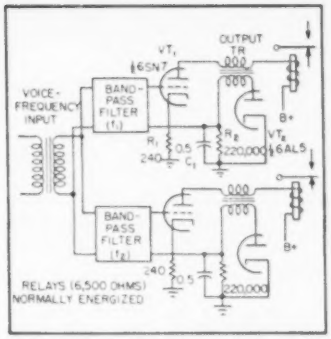


FIG. 4—Double receiver used for on-off control over a radio link

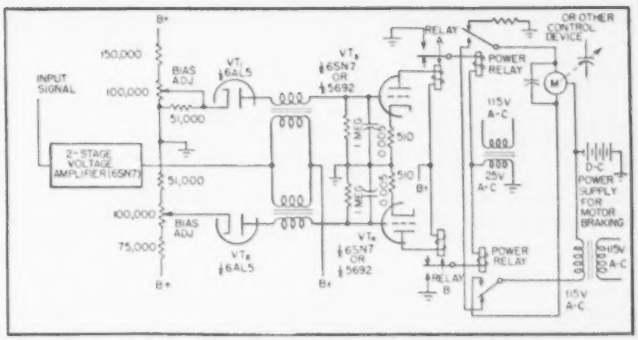


FIG. 5—Differential signal receiver circuit used to control reversible motor over radio link between airport station and remote station

through transformer T_2, a variable attenuator and a bandpass sending filter to the line. Thus, depending upon the kind of sending-loop equipment used, the diode can be keyed from off to full on or to various sending levels at very high speeds.

Receivers

Various types of receivers are associated with the universal transmitter described, depending on the service requirement. For the on-off control of heavy-current circuits such as primary power, a double receiver like that in Fig. 4 is used. This is capable of operating two circuits at a rate not to exceed 1 pps. Up to 18 such circuits can be operated on a single voice channel between 420 and 2,460 cps. Input from the voice-frequency circuit goes to the primary of an input transformer whose secondary feeds two bandpass filters, each of which selects one frequency. One of the two frequencies, say f_1, goes to the grid of triode section VT_1. The plate of this section is in series with the related output transformer and relay coil. Cathode-bias resistor R_1 is such as to permit enough d-c to flow in the plate circuit to operate the relay with no signal.

When a signal of proper frequency is received, it is amplified in VT_1 and appears across the secondary of the output transformer. It is then rectified by one section of VT_2 and applied through network R_2C_1 and the bandpass filter as a negative bias on the grid of VT_1. This reduces the d-c plate current of VT_1 and allows the relay to release. Both front and back contacts are provided on this relay so it can be connected either normally-open or normally-closed.

For dial control and manual telegraph keying, another type of receiver is used. These units handle pulsing at rates up to 28 pps, depending upon the filters used. The input transformer and bandpass filters are arranged as in Fig. 4 but each filter is followed by a two-stage resistance-coupled limiter amplifier using a 6SL7. When an incoming signal is strong enough to drive the grid of the first stage positive, grid-circuit clipping takes place to produce limiting. Amplifier output is rectified by one diode section of a 6AL5, which impresses a negative bias on the grid of a triode output section (half of a 6SN7). This section, a d-c amplifier, receives its plate voltage through the relay coil. Without signal, plate current is high enough to energize the relay. Negative bias created by a received signal drives the output triode to plate-current cutoff and releases the relay, which thus follows the signal.

Motor Control

Primarily designed for operation of a reversible motor over a radio control circuit, the differential signal receiver of Fig. 5 is actuated by three discrete signal amplitudes: nominal level, —10 db from nominal, and no signal. Up to 18 of these motor-control circuits are obtainable between 420 and 2,460 cps at 120-cps spacing.

The received signal is amplified and fed to separate diode rectifiers VT_3 and VT_5 in Fig. 5. The outputs of the rectifiers drive d-c triode amplifiers VT_4 and VT_6, which respectively control relays A and B. A received signal of proper frequency and above a median level, which is adjustable for relays A and B, releases the relays.

When no signal is being received, grid bias on triode sections VT_4 and VT_6 is such that plate current flows, operating both relays as shown. With signal high enough to override the bias of either diode, rectification takes place, developing negative grid bias on the corresponding triode section and either reducing or cutting off plate current, depending on the value of the developed bias. Plate current below the range of 2.5 to 4 ma releases the relays. Differential bias adjustment on the two rectifiers causes the two relays to operate at different signal levels.

With power relays and a reversible motor connected as in Fig. 5, either forward, reverse or stationary operation is obtained respectively from nominal, 10 db below nominal, or absence of tone. Serious fading or failure of the radio link will not cause rotation of actuated controls.

Identically geared, reversible a-c motors are used for both indicating and controlling purposes. A special arrangement places d-c on the windings when a-c is removed. This brakes the motor rapidly to a standstill and is necessary to keep the lightly loaded indicator motor in step with the heavily loaded controlled motor.

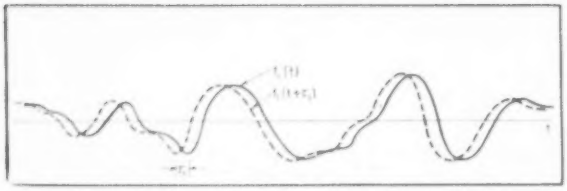


FIG. 1—Time functions used for determining the autocorrelation function of a stationary random process

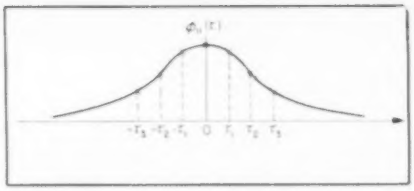


FIG. 2—Autocorrelation function of random time function that can represent a voltage or current

Correlation Functions and Communication Applications

A RECENT ADVANCE in communication engineering which has attracted considerable attention is the development of a new communication theory based on the statistical concept of information. Norbert Wiener, in his work entitled "The Extrapolation Interpolation and Smoothing of Stationary Time Series" which first appeared as an NDRC Report in 1942, disclosed his statistical prediction and filtering theory which has served as a starting point for much of the recent work by other investigators.

On the more general problem of control and communication, not only in the machine but the animal as well, Wiener has expounded the theory in his book "Cybernetics." Here the theory of information received a rigorous treatment. Independently, but at about the same time, C. E. Shannon in his papers appearing in the *Bell System Technical Journal* arrived at essentially the same conclusions concerning the theory of information.

It is not the purpose of this article to delve into information theory or prediction theory or any other portion of the new communication theory. We are primarily interested in bringing to the attention of the reader certain functions and techniques, arising from the new development, which have proved to be of considerable importance and effectiveness in the solution of a number of problems. Interesting applications of these techniques have been and are being made. These functions enter in one way or another, with varying degree of importance, in the various problems that are subject to the new statistical approach. The functions concerned are known as correlation functions.

Messages and Noise

Correlation functions are related in a quite natural way to time functions (or time series), which carry information. Instead of plunging into a quantitative and precise definition of an information-carrying function, let us consider qualitatively some of the features of this type of function. For our present purpose this will suffice.

If a time function carries information, and the flow of information is uninterrupted, it is essential that the function be of such a nature that its variations from instant to instant are at least incompletely predictable as far as the receiver is concerned. For if complete specification of the function by the receiver is possible, it is no longer a message in the true sense of the word and should not be sent over the transmission system in its entirety. For the identification of this particular message only a code number need be transmitted instead of all of its details.

Clearly a message should not be represented by a sinusoidal wave whose past and future are completely determined once its amplitude, phase and frequency are known. When information concerning these quantities is given to the receiver, continuation of the transmission of the sinusoid brings no further information.

A message need not be confined to those derived from spoken or written words. It may be any continual fluctuation, which does not follow a simple law of variation due to the complexity of the actuating mechanism, of a part of a system or the property of such a part carrying information needed for the control of other components in the functioning of the system. Thus the path of an airplane in a fire-control system, temperature

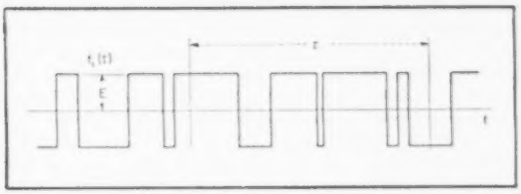


FIG. 3—Time function having random zero crossings following the Poisson distribution law

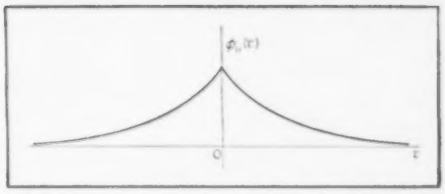


FIG. 4—Autocorrelation graph for random-width pulses of Fig. 3

How messages and other continuous information-carrying functions can be described in terms of statistics and probability. Required measurements are easily made with an electronic correlator. Engineering applications described include detector providing 30-db gain for signal that is 15 db below noise level

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changes in an industrial process, impulses in the nervous system and wind gusts on an airplane with automatic control are examples of messages.

When fluctuations cause a disturbance in a system over which a message is being transmitted they are known as noise. Broadly speaking, a noise need not be classified as such because of its sound, for if two messages are sent through a common channel the undesired message at one receiver is a noise to be eliminated while the reverse is true at the other receiver.

In the analysis of messages and noise or in the design of systems for their transmission or elimination, it is reasonable that we consider an ensemble of messages and an ensemble of noise. Generally we are not interested in the properties of a single message and we do not design a system for the transmission of a particular message. Furthermore, certain idealizations have to be made in regard to the fluctuating phenomena that we deal with for the simplification of the analytical work.

One assumption we make is that the time functions are physically of considerable duration so that theoretically they extend from the infinite past to the infinite future. Another assumption is that the statistical properties of these functions are invariant under a shift in the time origin. In other words, they are stationary in time. These assumptions are easily justified for a large number of practical situations.

Messages and noise are regarded as stationary random processes and are described and characterized in terms of statistics and probability. A stationary random process is defined in terms of probability distribution functions. For the general case, the definition requires a complete set of joint probability distribution functions together with the simple amplitude distribution. Most of these distribution functions are difficult to determine both theoretically and experimentally. However, this difficulty has not substantially hindered our progress in the application of the new theory. One reason is that in most of the applications we are able to make at present, not all of the distribution functions are necessary. The more important reason is that in these applications direct measurements of distribution functions are unnecessary. Other characteristics which are dependent upon the distribution functions are actually preferable and readily measured experimentally. We refer, of course, to the correlation functions.

Autocorrelation

For a large number of physical applications, the most useful characteristic of a stationary random process is its autocorrelation function. One method of expressing this function involves the use of only the first joint distribution function of the process just referred to. Another method of defining this function which avoids the use of the joint distribution function calls for the consideration of a member function of an ensemble, which represents the random process, instead of the entire ensemble. Thus, if $f_i(t)$ represents the member function in question, the autocorrelation function is defined as

$$\varphi_{ii}(\tau) = \lim_{T \to \infty} \frac{1}{2T} \int_{-T}^{T} f_i(t)\, f_i(t+\tau)\, dt \quad (1)$$

In a general sense the correlation function shows the degree of dependence of one value in a time

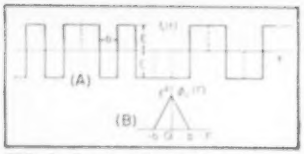

FIG. 5—Random distribution of equal-length positive and negative pulses, corresponding to tossing a coin heads or tails, and triangular autocorrelation function obtained

series to another at a different time. As indicated by the equation, to obtain a point on the autocorrelation curve for a value of $\tau = \tau_1$, $f_1(t)$ which represents a message or a noise as the case may be is given a displacement τ_1 for all values of t, obtaining $f_1(t + \tau_1)$. Then the product $f_1(t)f_1(t + \tau_1)$ is formed for all t. The integral of the product is then taken over the entire duration of the function, which theoretically is infinity. However, practically, a sufficiently long duration is considered and the resulting integral is divided by the duration for the mean value which is represented by $\phi_{11}(\tau_1)$. The steps of operation are indicated in Fig. 1.

From geometric considerations, it is clear that the same value is obtained if the shifting of $f_1(t)$ is now done in the other direction. In other words $\phi_{11}(\tau_1) = \phi_{11}(-\tau_1)$. A continuation of the process determines the whole curve which is even in the variable τ.

A sample autocorrelation curve in this elementary graphical determination is shown in Fig. 2. We observe that the value of $\phi_{11}(\tau)$ at $\tau = 0$ is obtained from the mean of the square of the given function and should be a value which cannot be exceeded by any other value of the curve. If the function represents a voltage or a current and a load of one ohm is assumed, the point $\phi_{11}(0)$ gives the mean power of the function.

The expression in Eq. 1 for the autocorrelation function of a member function of a random process is known as a time average for $\phi_{11}(\tau)$. The expression of the autocorrelation function in terms of the first joint distribution, called the ensemble average, is not given here because it is not essential for our purpose in the present discussion. It is sufficient to point out that the two expressions are equivalent for stationary random processes, according to an important theorem in random processes known as the Ergodic Theorem. In effect the theorem states that the autocorrelation function obtained from a member function — of sufficiently long duration—of a random process is the same as that obtained from the process as a whole. In short, a time average is equivalent to an ensemble average for a stationary random process.

Crosscorrelation

In a manner similar to the definition of Eq. 1, the crosscorrelation between two functions $f_1(t)$ and $f_2(t)$ is defined as

$$\varphi_{12}(\tau) = \lim_{T \to \infty} \frac{1}{2T} \int_{-T}^{T} f_1(t)\, f_2(t+\tau)\, dt \quad (2)$$

When the functions $f_1(t)$ and $f_2(t)$ originate from different sources, as for example speech and resistor noise, we expect their crosscorrelation (obtained on the basis of a long duration $2T$) to be the same for every value of the displacement τ. The crosscorrelation value becomes zero for this case if the mean of either $f_1(t)$ or $f_2(t)$ is zero.

When the crosscorrelation function for two functions is a constant or zero, the functions are said to be incoherent. This case is common, but there are situations in which $f_1(t)$ and $f_2(t)$ are dependent though not identical so that their crosscorrelation is a good measure of their coherence.

Periodic Functions

A point of considerable importance is that the definitions in Eq. 1 and 2 for the autocorrelation and crosscorrelation of stationary random processes may also be applied to periodic functions. Frequently a random process has a hidden periodic component and it becomes important in many practical problems to separate the periodic and random components. The fact that correlation functions are applicable to both types of functions and their operations on them produce results of markedly different characteristics, renders these functions particularly important in problems of this type.

For a periodic function, we need not consider the ensemble average, and the duration over which the function is considered need be only one complete cycle of the function. Hence Eq. 1 for a periodic function $f_1(t)$ reads

$$\varphi_{11}(\tau) = \frac{1}{T_1} \int_0^{T_1} f_1(t)\, f_1(t+\tau)\, dt \quad (3)$$

and Eq. 2 for periodic functions $f_1(t)$ and $f_2(t)$ of the same fundamental frequency reads

$$\varphi_{12}(\tau) = \frac{1}{T_1} \int_0^{T_1} f_1(t)\, f_2(t+\tau)\, dt \quad (4)$$

in which T_1 is the complete period of $f_1(t)$ and $f_2(t)$.

Let us put

$$f_1(t) = A_1 \cos(\omega_1 t + \theta_1) \quad (5)$$

and evaluate its autocorrelation function. By application of Eq. 3 the autocorrelation function is

$$\varphi_{11}(\tau) = \frac{A_1^2}{2} \cos \omega_1 \tau \quad (6)$$

For the general case of an arbitrary periodic function

$$f_1(t) = \frac{a_0}{2} + \sum_{n=1}^{\infty} a_n \cos(n\omega_1 t + \theta_n) \quad (7)$$

the autocorrelation function becomes

$$\varphi_{11}(\tau) = \frac{a_0^2}{4} + \frac{1}{2} \sum_{n=1}^{\infty} a_n^2 \cos n\omega_1 \tau \quad (8)$$

From these results we obtain the following general properties of the autocorrelation function of a periodic function:

(1) The autocorrelation function is periodic with the period of the given function.

(2) The autocorrelation function is a cosine series dropping all

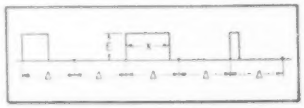

FIG. 6—Duration-modulated pulses, characterized by equally-spaced leading edges

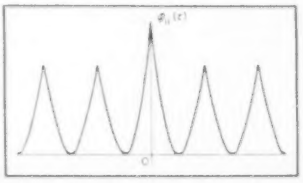

FIG. 7—Autocorrelation function for duration-modulated pulses

phase angles in the harmonics of the original function.

(3) The amplitudes of the harmonics in the autocorrelation function are obtained from the corresponding harmonic amplitude by squaring and multiplying by the factor $\frac{1}{2}$.

Random Processes

The actual computation for the autocorrelation function of a random process involves more background material than we have presented here. We shall not attempt any detailed exposition of the process of computation but simply state the results which are known for some idealized cases. The case of the flat-top wave of alternating positive and negative pulses of varying duration as shown in Fig. 3 is interesting. The assumption made in this problem is that the distribution of the zero-crossings follows the Poisson Law which states that if the average number of zero-crossings per second is k, the probability $P(n,\tau)$ that there are n zero-crossings in any duration τ of the wave is given by the formula

$$P(n,\tau) = \frac{(k\tau)^n}{n!} e^{-k\tau} \qquad (9)$$

On this basis the autocorrelation function may be shown to have the simple form

$$\varphi_{ii}(\tau) = E^2 e^{-2k|\tau|} \qquad (10)$$

A graph of this function appears in Fig. 4.

A series of rectangular pulses of the same size appearing consecutively each with equal probability of being positive or negative, as the sketch in Fig. 5A illustrates, may be experimentally formed by the tossing of a coin whose heads indicates a positive pulse and tails a negative one. The autocorrelation function for such a series may be obtained from consideration of probability and has the form of a triangle as Fig. 5B shows. Autocorrelation functions have been found analytically for a number of cases having varying degrees of complexity. Some of these results have been useful in practical application, particularly in problems on noise and interference.

A random process where a hidden periodic component exists is found in the transmission of messages by pulse-duration modulation and similar types of pulse-modulation. For the typical pulse-duration modulation signal shown in Fig. 6 the leading edges of the pulses are spaced an interval of 2Δ. For reason of simplicity in computation, let us assume that the pulse duration varies independently between the limits of zero and Δ with a uniform distribution. With this simplifying condition, we may show that the autocorrelation function is of the form shown in Fig. 7. Separating this function into its periodic and nonperiodic components, we find that they appear as in Fig. 8A and 8B.

Since a periodic function produces a periodic autocorrelation function, we consider that the periodic autocorrelation function of Fig. 8A results from the hidden periodic component in the original pulse-duration modulation wave. The remainder in Fig. 8B, which is nonperiodic, is the result of the random component in the wave. This remarkable property of autocorrelation finds several interesting applications concerning which we shall have a further discussion.

Wiener's Theorem

A theorem of great importance both theoretically and physically relates the autocorrelation function to the power density spectrum of the random process. This theorem has been given a rigorous treatment by N. Wiener and generally bears his name. It states that if $\phi_{ii}(\omega)$ represents the power density spectrum of a random process whose autocorrelation function is $\phi_{ii}(\tau)$ then the following reciprocal relations must hold:

$$\varphi_{ii}(\tau) = \int_{-\infty}^{\infty} \Phi_{ii}(\omega) \cos \omega\tau \, d\omega \qquad (11)$$

$$\Phi_{ii}(\omega) = \frac{1}{2\pi} \int_{-\infty}^{\infty} \varphi_{ii}(\tau) \cos \omega\tau \, d\tau \qquad (12)$$

In other words, the autocorrelation function and power density spectrum of a stationary random process are determinable one from the other by a Fourier cosine transformation. Let us illustrate one application of this theorem by an example.

Referring to the flat-top wave of Fig. 3, which we regard as representing a voltage fluctuation with a load of one ohm, we wish to know the spectrum of the fluctuating voltage. If only Fourier series and Fourier integral theories for periodic functions and transients are at our disposal, we are not sufficiently equipped to solve a problem of this sort. The reason is simply that these theories, as they stand, are not applicable to functions which are specified in terms of statistics and probability and are not representable by specific analytic expressions giving their precise values for all values of the independent variable. However, the extension of the Fourier

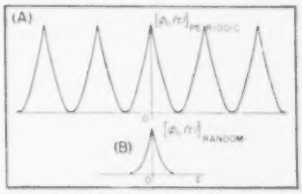

FIG. 8—Periodic and random components of autocorrelation function for duration-modulated pulses

theories to the harmonic analysis of random processes through the medium of correlation functions has enabled us to obtain a solution to our problem with surprising ease. Thus, applying Wiener's theorem we find that the power density spectrum in watts per radian per second of the fluctuating voltage is, as Eq. 12 states,

$$\Phi_{ii}(\omega) = \frac{1}{2\pi} \int_{-\infty}^{\infty} E^2 e^{-2k|\tau|} \cos \omega\tau \, d\tau$$

$$= \frac{E^2}{\pi} \frac{2k}{4k^2 + \omega^2} \qquad (13)$$

In this calculation we have made use of the autocorrelation function in Eq. 10.

Measurement of Correlation Functions

Due to the fact that every point of a correlation curve should represent the result of a large number of observations made on the random function so as to ensure its close approximation to the true value, the calculation of the correlation curve from experimental data by the

method briefly described in conjunction with Fig. 1 and 2 is often slow and tedious. Various mechanical and electrical devices are being developed in a number of research laboratories for the rapid and accurate determination of correlation curves. One method applying electronic techniques has been in use in the Research Laboratory of Electronics, MIT. The method avoids the difficulties of continuous multiplication required in the defining Eq. 1 for the autocorrelation function by an application of the theory of sampling. In this electronic correlator, the random function as it is fed into the device is sampled at regular intervals as indicated in Fig. 9 so that the values $a_1, a_2, a_3, \ldots$ are obtained.

While this sampling is in progress a second set of values $b_1, b_2, b_3, \ldots$ are taken, each trailing a corresponding value of the first set by a time τ_1. The order of taking the samples is as indicated in the figure so that they appear in the order $a_1, b_1; a_2, b_2; a_3, b_3; \ldots$ From these pairs of values a series of pulses is formed in such a manner that their heights are proportional to the values $a_1, a_2, a_3, \ldots$ and their durations to the values $b_1, b_2, b_3, \ldots$ as shown. An integrating circuit gives a voltage corresponding to the sum of the products of the pairs of sampled values of the random function.

It may be shown that the autocorrelation function at the point τ_1 is given by the approximate formula

$$\varphi_{ab}(\tau_1) \approx \frac{K}{N} \sum_{n=1}^{N} a_n b_{n_1} \qquad (14)$$

where K is a factor of proportionality. Repetition of this process for other values of τ determines the autocorrelation curve. The operations required for obtaining the complete curve are automatic. The correlator is shown in Fig. 10. A sample autocorrelation function for filtered noise is given in Fig. 11.

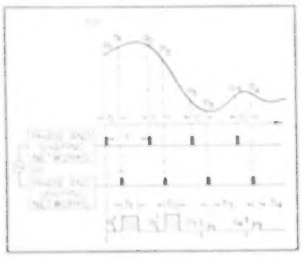

FIG. 9—Method of sampling a random function at regular intervals with an electronic correlator

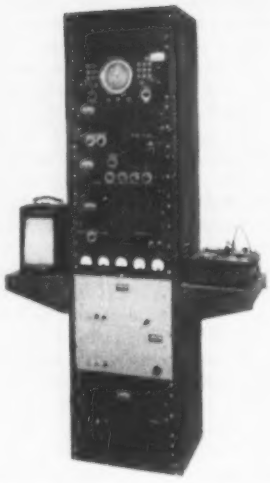

FIG. 10—Electronic correlator built at MIT for obtaining complete autocorrelation curve of a random function automatically on recorder at left

Power Spectrums

In connection with the Wiener theorem for autocorrelation functions, we have already shown the effectiveness of spectrum calculation through the medium of correlation. It is generally true that the spectrum of a stationary random process is most readily found by this method if the problem is simple enough for solution. As further examples of spectrum calculation let us point out that the power density spectrum of the random series shown in Fig. 5 is simply the cosine transform of the autocorrelation curve in Fig. 6. Similarly the cosine transform of the nonperiodic autocorrelation curve in Fig. 8B is the power density spectrum of the random component in the pulse-duration modulation wave of Fig. 6.

The spectrums of a large variety of stationary random processes under simplifying conditions are not difficult to determine. These spectrums have been useful in noise problems. Some nonlinear cases have also been attacked with success. An example of such cases is the spectrum of noise through a rectifier.

On the experimental side, the correlation method of finding a spectrum has also proved its effectiveness. With adequate equipment, experimental determination of a complete correlation curve should be simpler and often more accurate than the determination of a complete spectrum by use of filters.

An example of the experimental evaluation of the spectrum through the correlation process is given in Fig. 12. Here the autocorrelation curve for random noise from a gas tube is obtained by the use of the electronic correlator. The cosine transformation required to produce the spectrum is performed by an electronic differential analyzer developed at MIT.

The fact that it is possible to measure correlation curves for very small and comparatively, very large values of τ without excessive demands on the size and accuracy in the equipment, means that a nearly complete spectrum curve is not difficult to obtain. On the other hand, if the spectrum is to be obtained from frequency measurements, we may encounter some difficulties at low frequencies because requirements in equipment at these frequencies are not conveniently met.

Detection

In giving an example on the autocorrelation of a random process, as illustrated in Fig. 6, 7 and 8, we have noted the interesting fact that autocorrelation is capable of separating the periodic and random components in the process. Let us further consider the case of a mixture of random noise $f_N(t)$ and a periodic function $f_S(t)$. By our assumption that the noise has no periodic component it is obviously true that $f_N(t)$ and $f_S(t)$ are incoherent. Let the mixture be written as

$$f_1(t) = f_N(t) + f_S(t) \qquad (15)$$

According to Eq. 1, the autocorrelation function of $f_1(t)$ is

$$\varphi_{11}(\tau) = \lim_{T \to \infty} \frac{1}{2T} \int_{-T}^{T} \left[f_N(t) + f_S(t) \right] \left[f_N(t+\tau) + f_S(t+\tau) \right] dt \qquad (16)$$

which simplifies to

$$\varphi_{ii}(\tau) = \varphi_{NN}(\tau) + \varphi_{SS}(\tau) \quad (17)$$

the crosscorrelation terms having been dropped because of incoherence between $f_s(t)$ and $f_s(t)$. Our result states that the autocorrelation function of the sum of the noise and periodic function is the sum of their individual autocorrelation functions.

In Fig. 13 we have illustrated the correlation curves for the case of $f_s(t)$ being a sinusoid. Let us consider the behavior of the curves at comparatively large values of the variable τ. Theoretically the noise autocorrelation curve approaches the square of the mean value of the noise as τ becomes large; that is, $\phi_{ss}(\tau)$ is a constant (or zero, if the mean is zero) for large τ. On the other hand, since the autocorrelation function of the sinusoid is another sinusoid, its behavior is the same irrespective of the magnitude of τ.

We see that if autocorrelation is performed on a random noise at reasonably large values of τ, so that in the absence of a periodic wave the result is a constant, the presence of a periodic wave in the noise will result in a periodic curve instead of the constant (or zero). Theoretical considerations show that a periodic wave in random noise, however small, may be detected by this method. However, errors in measurement and finite time of observation set a limit to what we can physically accomplish.

The power of this method in detection has been demonstrated in the laboratory. Reproduced in Fig. 14 is a set of curves obtained from the electronic correlator mentioned earlier for various input signal-to-noise ratios. The comparatively flat portions of the curves are obtained with only random noise at the input. As soon as the sinusoid was introduced into the noise the sinusoidal form of the output became evident. One of the curves in Fig. 14 shows that for an input signal-to-noise ratio of nearly −15 db the output signal-to-noise ratio appears to be about +15 db, so that the net gain is approximately 30 db. In a problem of detection of weak periodic signals in noise a gain of this magnitude is definitely an achievement.

The numerical values given here do not indicate practical limits, for still greater improvement in signal-to-noise ratio is possible by lengthening the time of observation and improving the accuracy of the equipment. Furthermore, when the frequency of the periodic signal is known, a local sinusoidal (or some other simple periodic form) voltage of the known frequency may be used for the purpose of crosscorrelating it with the incoming noise and signal mixture. By the application of crosscorrelation an additional substantial gain may be achieved.

In several respects this new method of detection is superior to the use of narrow-band filters. The correlator operates in the time domain to achieve a result that an extremely narrow-band filter could produce in the frequency domain. But while the correlator separates a sinusoid from random noise irrespective of its frequency as long as it is within the bandwidth for which the correlator is designed, a narrow-band filter, as its name implies, does not have this advantage. Because of this and other reasons the search for a periodic signal in random noise by the method of correlation is by far a simpler, more effective and more economical method than filtering.

Optimum Linear Systems

Correlation functions occupy an important position in the statistical prediction and filter theory of Wiener. The reason for their prominence may be readily traced to the criterion for system design in the theory. Let us illustrate by considering the problem of statistical filtering. In very general terms, the filter problem requires that the instantaneous output of the filter to be designed should be, on the average, as nearly as possible the same as the desired message when the input of the system is the corrupted message. In formulating this problem Wiener takes as a measure of error in the design the mean of the square of the difference between the actual output $f_o(t)$ and the desired output which is, in the case of filtering, the message itself $f_M(t)$ with possibly a delay α. Therefore the error expression is

$$\epsilon = \lim_{T \to \infty} \frac{1}{2T} \int_{-T}^{T} \left[f_o(t) - f_M(t - \alpha) \right]^2 dt \quad (18)$$

The output $f_o(t)$ is expressible in terms of the system characteristic and the input to the system. The adoption of this measure of error, with the consequential criterion that the design of the best system should reduce the mean-square error to its minimum, introduces into the design problem correlation functions. This fact becomes clear when the mean-square error expression of Eq. 18 is expanded according to the square law and simplified. As a matter of fact, the specific correlation functions required as basic data in the predic-

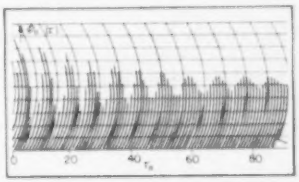

FIG. 11—Example of autocorrelation function for filtered noise, as recorded by correlator

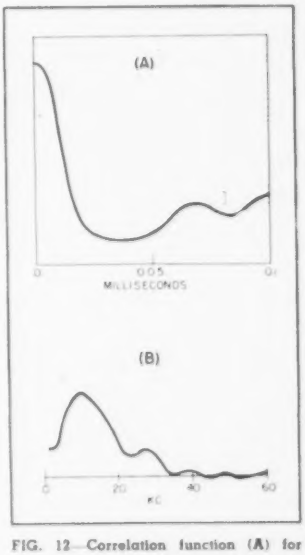

FIG. 12—Correlation function (A) for noise from a type 884 gas tube, as obtained with electronic correlator, and corresponding power spectrum obtained by making cosine transformation of function with an electronic differential analyzer

tion and filter theory are the autocorrelation function of the input and the crosscorrelation function of the input and the desired output. We shall not go into details here but should emphasize the fact that in the theory of optimum linear systems all input and output functions are completely characterized by their correlation functions, when the design criterion is the least-mean-square-error criterion.

Impulse Response

The correlator may be used to determine the impulse response of a linear system such as an electrical network or an acoustical transducer. It can be shown that if the network is excited by a white noise source, i.e. one whose spectrum is flat over a frequency range that exceeds the pass band of the device being tested, the crosscorrelation between the input and output is the impulse response of the system, for in general the crosscorrelation between input and output is given by the integral

$$\phi_{io}(\tau) = \int_{-\infty}^{\infty} h(t)\, \phi_{ii}(\tau - t)\, dt \qquad (19)$$

where $h(t)$ is the system response to a unit impulse and $\phi_{ii}(\tau)$ is the autocorrelation of the input signal. If the input signal is a white noise as assumed, Eq. 19 simply becomes

$$\phi_{io}(\tau) = h(\tau) \qquad (20)$$

This measurement technique has considerable advantage over standard impulse amplitude measurement methods when it is necessary to work against large noise backgrounds, or in cases where it is desired to use small input signals. The system function of the circuit can be obtained by taking the Fourier transform of $\phi_{io}(\tau)$ in the manner previously indicated.

It is easy to see physically that the crosscorrelation function should be the impulse response, for if the input signal is really a white noise it consists of a series of independent pulses, and the crosscorrelation measures the relationship between an input pulse and the effect it has on a circuit an arbitrary time τ later. The impulse response is just the response at any time τ after $\tau = 0$ to an impulse input. The crosscorrelation measures the average of a large number of such input pulses to form a value for $\phi_{io}(\tau)$.

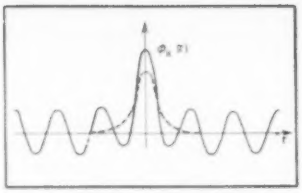

FIG. 13—Autocorrelation function of additive mixture of random noise and sine wave

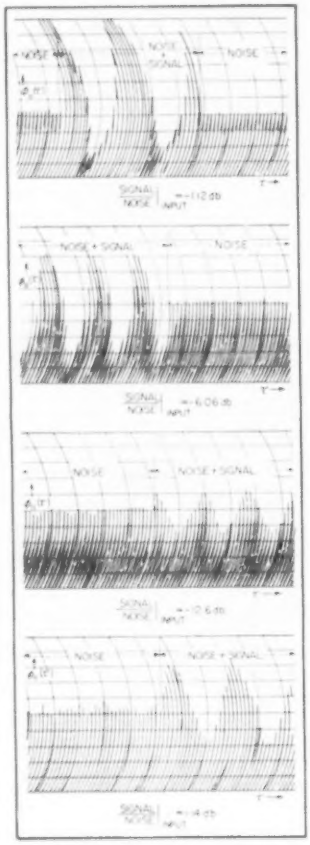

FIG. 14—Experimental results obtained by using electronic correlator to detect pure 8-kc sine-wave signal at four different levels below that of random noise. Sinusoidal output is clearly evident in each case

If one is only interested in the amplitude of the system function, it may be obtained from the output autocorrelation. If the input to the system is a white noise the autocorrelation is the Fourier transform of the amplitude function squared.

Measuring Crosstalk

In multichannel communication systems it is often desirable to make a measurement of the crosstalk induced from one channel to another. In most systems the amount of crosstalk is dependent not only upon the signals present in the two channels being investigated, but also upon signals in the other circuits of the system. An example of this is the cross-modulation in a frequency-division multiplex system in which several modulated carriers of different frequencies are mixed together and transmitted through the amplifiers of a single radio or wire circuit. Nonlinearity in the amplifier results in intermodulation and distortion products which are a function of the signals in all channels.

Normally it is difficult to load all of the circuits and still measure the effects due to a single channel. However, if each of the channels is fed by an independent noise generator so that the crosscorrelation function taken between any two noise sources is zero, then the amount of noise introduced into a given channel by means of any other channel can be obtained by measuring the crosscorrelation between the input to the offending channel and the output of the circuit being studied. The system can be calibrated by supplying known amounts of the offending channel noise into the circuit being measured. The value of the crosscorrelation obtained under these conditions provides an accurate calibration.

Numerous attempts have been made to measure the information transferred by a linear system. Such measurements have precise meaning when applied to servomechanism systems and radar systems but are often not important as applied to human communication systems, because the properties of the human transducers, eyes and ears, which are left out of the computation, are the governing factors in controlling information rate.

The work covered here has been supported in part by the Signal Corps, the Air Materiel Command and O.N.R.

Producing The 5820 Image Orthicon

Many special techniques are involved in the manufacture of the 5820, with its extremely high sensitivity and its close adherence to the spectral response of the human eye. This paper describes and illustrates the various steps in its production

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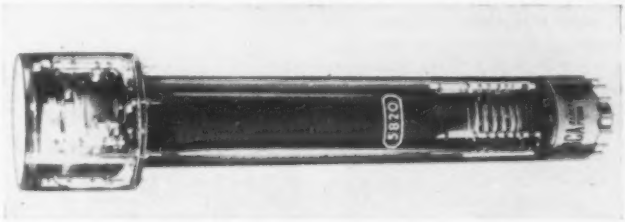
THE IMAGE ORTHICON, cornerstone of modern tv broadcasting, has undergone many improvements since its introduction in 1946. Among the important refinements are: better resolution, higher sensitivity and color response more closely matching that of the eye. These trends are illustrated by four models of the image orthicon, known as types 2P23, 5655, 5769, and 5820.

The type 2P23 was introduced in 1946 for remote pickup use.[1] Since this tube had unheard-of sensitivity, compared to the earlier iconoscopes and standard orthicons, it was widely adopted despite poor resolution and excessive infrared response. The resolution and sensitivity were increased, without change in type number, but the poor tonal rendition in the presence of infrared remained.

A year later, type 5655 was announced for studio use.[2] The stricter requirements of studio work were met by a new photosurface with less infrared pickup, and by improved signal-to-noise ratio made possible by a new target structure having higher target capacitance. The 5655 was not highly sensitive, however, and illumination of the order of 200 to 300 footcandles (incandescent) or 150-200 footcandles (fluorescent) was needed to provide adequate depth of focus. The improved color rendition was so important, however, that in 1948 type 5769, combining the features of types 2P23 and 5655, was introduced. This tube covered a wide range of illumination, in addition to good color response and better sensitivity, but greater sensitivity was needed for incandescent light. What was



Type 5820 image orthicon television camera tube

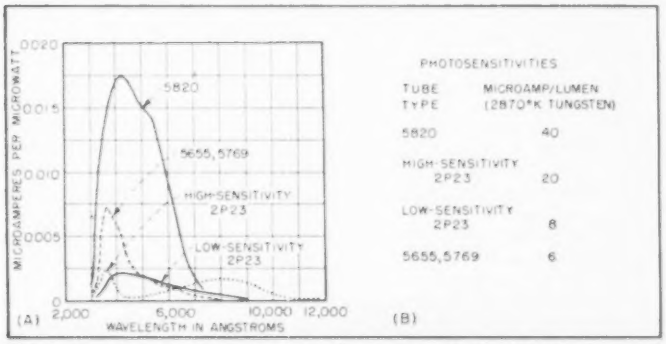


FIG. 1—Comparative spectral responses and overall sensitivities of the four types of image orthicons

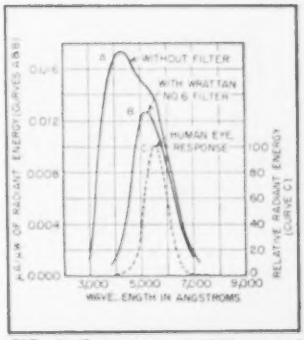


FIG. 2—Comparison of 5820 spectral response with that of human eye

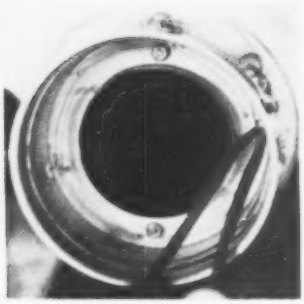


FIG. 3—Image section of the 5820. Evaporators are being welded in place

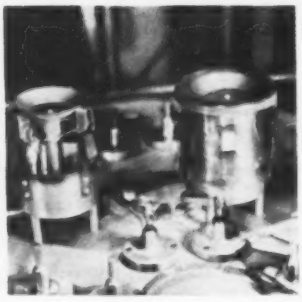


FIG. 4—Image-section glass caps are aluminized in an evaporating system

FIG. 5—The glass target section is cut from a carefully-blown glass bubble

needed was a tube with much higher sensitivity throughout the visible range, matching the eye response curve as closely as possible. This need has recently been met, in the type 5820, by the introduction of a new type photosurface, the production of which is described in this paper. The target structure of the new tube is like the older 2P23 and 5769.

Figure 1 shows the comparative spectral responses and overall sensitivities of the four types of image orthicons. The curves are plotted on an absolute basis, giving the output current in terms of a microwatt of radiant power at each wavelength shown. It will be noted that the latest tube, type 5820, not only has exceptionally high sensitivity but possesses its principal response almost entirely in the useful region, in the visible range from 4,000 to 7,000 angstroms. Figure 2 shows the close relationship between the type 5820 spectral response when fitted with a Wratten No. 6 filter and response of the eye.

Using the type 5820 a usable picture can be obtained with 1 or 2 footcandles of illumination, although 20 to 30 footcandles should be used to provide good depth of focus and to reproduce properly the dark tones in the gray scale. When used in outdoor pickups, the tube is so sensitive that neutral-gray filters may be required. On very bright sunny days a filter transmission of 5 percent is satisfactory, whereas on bright cloudy days (500 to 1,000 footcandles), the filter transmission should be about 10 percent. More detailed operating characteristics have been described in a recent publication[3].

To give a clearer picture of the problems involved in manufacturing the image orthicons, a series of photographs of some of the more complicated assemblies is shown.

Figure 3 is a photograph of the image section of the tube taken from the photocathode end. The evaporators which hold the material for forming the photocathode are being welded into position. These evaporators are the chief reason for the high sensitivity of the 5820. After the tube has been pumped and outgassed, the evaporators are heated to put a definite amount of evaporated material on the inside surface of the face plate.

During manufacture, many precautions are needed to keep the tubes free from any impurities that might affect the sensitivity of the photosurface. To avoid any contamination, evaporated aluminum is used for the metal coating necessary to connect the photosurface to a contact. Figure 4 shows the glass caps which will be sealed over the image section, set up in an evaporating system just prior to being aluminized.

Target Section

Next to the problem of making photocathodes of high sensitivity, the mesh target section of the tube is probably the most difficult fabrication problem. The target is a flat piece of glass only a little over 0.0001-inch thick sealed to a metal ring. The glass, originally in the form of tubing, must meet a number of specifications. Its coefficient of expansion must be fairly close to that of the metal ring; its electrical resistivity must be in a fairly narrow range; and its optical quality must be quite good.

The diameter and wall thickness of the tubing are selected for convenience in blowing the desired bubble from which the target section is cut, as shown in Fig. 5. This section is then placed on top of the target ring. After its thickness is checked by a hand spectroscope, the bubble and its ring are placed in a small metal box which, in turn, is placed in an oven held at an elevated temperature.

As the bubble begins to reach proper temperature, it seals itself to the ring and also tightens up so that it is flat. At this point, the box is removed from the oven and allowed to cool. The last step is to remove the excess glass from the outside of the target ring. The target, after being rechecked for thickness and freedom from defects, is ready for mounting in the mesh target assembly.

Figures 6, 7 and 8 show three of the steps in the manufacture of the 50-mesh copper screen which is mounted close to the glass target. A description of this process is given in a paper[4] by H. B. Law. The glass master, which is the heart of the process, consists of a glass plate which has been cross ruled with 500 lines per inch. After proper cleaning, the glass master is placed in a sputtering system, as shown in Fig. 6, and a thin layer of metal is sputtered over the entire ruled surface. Sputtering has the advantage over evaporation in that the tightness of the metal coating can be more easily controlled.

The next step is to remove the

FIG 6—Glass master is placed in sputtering system to form 500-mesh screen

FIG. 7—Completed 500-mesh screen and master being removed from bath

FIG. 8—Copper mesh is carefully removed from master and then inspected

metal from the surface but not from the bottom of the rulings. This part of the process calls for the right type of groove shape in the master, the proper thickness and tightness of the metal coating, and a special material for the rubbing. After the surface metal is removed, the master is placed in a plating bath so that copper will be deposited in the rulings.

Figure 7 shows the master being removed from the plating bath with the mesh completely formed. Figure 8 shows the mesh being removed from the master. After drying the mesh is examined for defects.

The mesh is now ready for mounting close to the glass target. Figure 9 shows the complete mesh-target assembly ready for insertion in a tube.

Curing Smudge

The solution of one particularly troublesome problem in connection with the mesh-target assembly is of interest. In the early image orthicons an effect which received the name smudge was very troublesome. The smudge showed up mainly in high lights when the camera was picking up a flatly lighted scene. Some areas of the picture would then be lighter or darker than others. If the border between these areas was sharp, this effect could be very troublesome, especially when the camera was panned.

The cause of smudging was finally traced to a difference in contact potential between different parts of the copper mesh on the side which faced the target. This difference in contact potential led to a variation in the true potential between the target and mesh in different areas. In the 5820, smudge has been greatly reduced by evaporating a metal such as aluminum onto the target side of the mesh before the mesh and target are assembled together.

Although much of the sensitivity of the image orthicon is due to the high photosensitivity of its photocathode and to the gain at the target, the signal multiplier also is a large contributing factor, especially at low light levels. Figure 10 is a photograph of one of the multiplier wheels with its vanes being assembled into a complete multiplier. Figure 11 shows a complete multiplier gun assembly being checked for possible shorts. The manufacture of multiplier parts requires much care to make sure that the tubes produced have good multiplier gains and are free from defects.

Many groups have contributed to the success of these new tubes. In the Tube Department at Lancaster, the authors wish to acknowledge the help of L. Young, A. D. Cope and J. K. Johnson in the fabrication and processing of the tubes, A. A. Rotow for his extensive testing, and C. T. Lattimer for the photographs.

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(4) H. B. Law, A Technique for the Making and Mounting of Fine Mesh Screens, *Rev. Sci. Inst.*, **19**, Dec. 1948.

FIG. 9—Complete mesh-target system ready for insertion in the tube structure

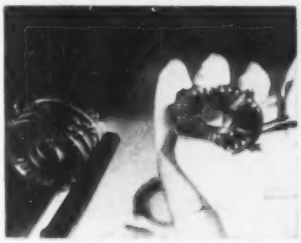

FIG. 10—A multiplier wheel being prepared for assembly in jig shown at left

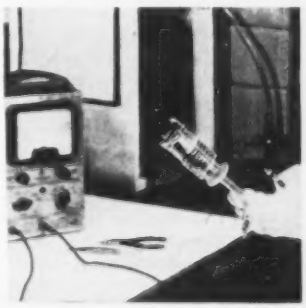

FIG. 11—Multiplier-gun assemblies are carefully examined for possible shorts

Amplifier used to provide controlled field current for dynamometer, employing twelve 807's in parallel

Dynamometer Control Simulates

Closed-servo electronic control system for laboratory automotive-engine dynamometer applies loads similar to those of auto accelerating on road. Effects of traffic hazards, wind, weather conditions and road bumps are thus eliminated when checking octane ratings of fuels or studying lubrication and wear during engine cyclic operations

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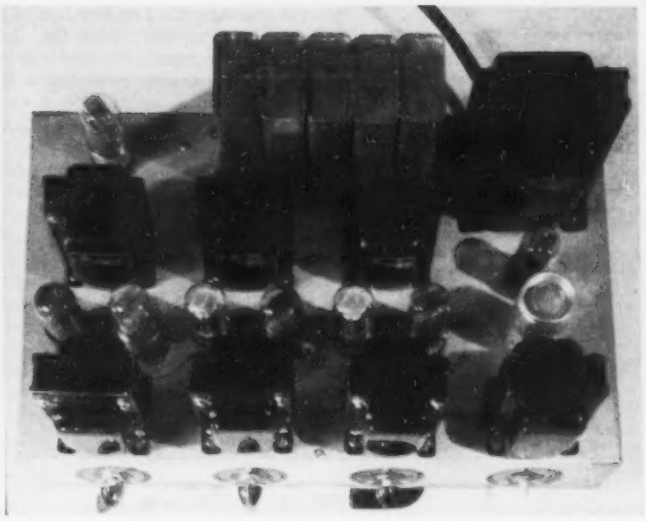
THE TENDENCY of a gasoline motor fuel to knock or detonate in a multicylinder automotive engine is affected by a number of operating variables, including engine speed, spark advance, cylinder-head temperature, fuel-air mixture ratio, distribution, mixture temperature and mixture density. In typical operation the engine is constantly changing with respect to one or more of these variables, with the result that detonation from a given fuel will vary greatly throughout the operating range. Fuels of varying hydrocarbon composition differ markedly in their tendency to knock and in the speed at which knock is most prominent.

It becomes exceedingly difficult, therefore, to define the performance of a fuel in an engine under operating conditions. In the past, motor-fuel octane ratings have been based on the motor method[1] and the research method[2], using laboratory engines operating at constant speed and fixed conditions. Recently, it has been realized that final automotive fuel ratings must be established on a multicylinder engine operating under road load conditions.

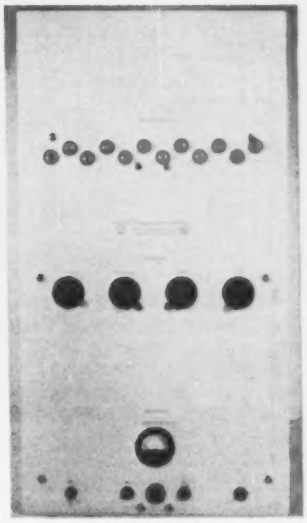
In view of this, it appeared desirable to develop a device for the laboratory automotive-engine dynamometer which could apply loads similar to the automotive engine on the road. It is believed that the accuracy and reproducibility of road-test ratings can be increased by the use of such a device in the laboratory, which eliminates the effects of traffic hazards, wind, variations in ambient air temperature, and road configuration. Although this control was developed primarily for fuel rating work, it may also be useful in fuel and lubricant deposit and wear studies, or other road-test problems where engine cyclic operation is a factor.

Test Technique

Dynamometer control devices have been built using a prearranged



Electronic control unit used between tachometer generator and dynamometer amplifier



Dynamometer acceleration control

Road-Testing of Engines

program employing a paper cam and photoelectric pickup[3], sequence relay system, or punched tapes in a pneumatic system. Essentially they are systems of controlled rheostats in the dynamometer field circuit.

The type of test used in fuel rating on the road involves high-gear acceleration at full throttle from 10 to 70 miles per hour. The acceleration curve of Fig. 1 was taken in a 1941 Chevrolet on a level highway. The torque curve is the load necessary to hold the engine at the speed shown, at full throttle.

Any laboratory device must, then, cause the engine to reproduce both these curves simultaneously, by representing to the dynamometer the inertia and resistance of any weight of car and any body type. The device could thus be used with any engine and any dynamometer to give the proper speed-versus-time (acceleration) curve, after setting the correct ratio of inertia and resistance loads. The device must, however, be capable of making successive runs rapidly and must start from any given speed.

The rise from *A* to *B* in the torque curve of Fig. 1 represents the increased load required at the instant the engine is given full throttle. This extremely high rate of application of load was the primary problem in the development of suitable equipment.

Major factors affecting acceleration are: (1) air resistance, which is a function of body design and varies as the square of the speed; (2) rolling resistance, which is a function of highway surface, tires and bearings and varies with speed and mass; (3) inertia, which is a function of mass and varies with acceleration. Summarizing, to a first approximation it can be said that the total resistance affects the ultimate speed to which an automobile can accelerate and the inertia affects the length of time to attain the ultimate speed; also, the resistance load on the engine varies with speed and the inertia load varies with acceleration.

Closed Servo System Used

The control system developed from these considerations employs a tachometer generator on the test engine crankshaft to provide a

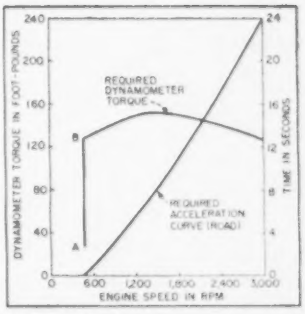


FIG. 1—Acceleration curve of 1941 Chevrolet going from 10 mph to 70 mph in high gear at full throttle on a level highway, and torque curve that electronic control system must produce to simulate this acceleration in laboratory

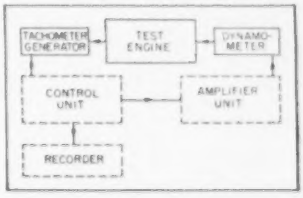


FIG. 2—Closed-servo electronic control system used with laboratory dynamometer to place controlled loads on auto engine

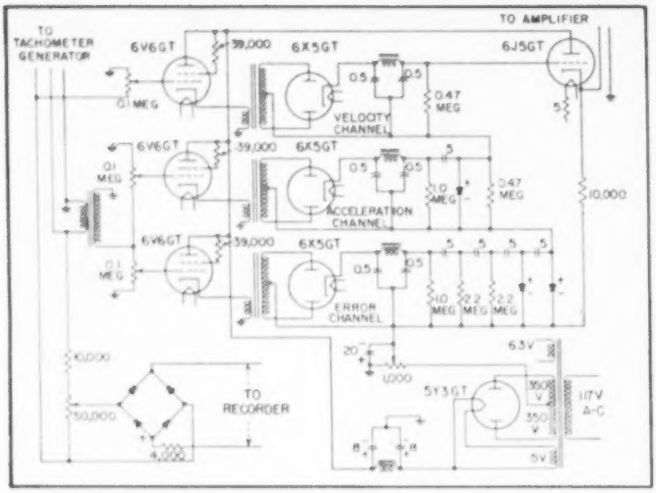


FIG. 3—Three-channel control unit. Input voltage is obtained from tachometer generator on engine, and output drives power amplifier that furnishes dynamometer field current

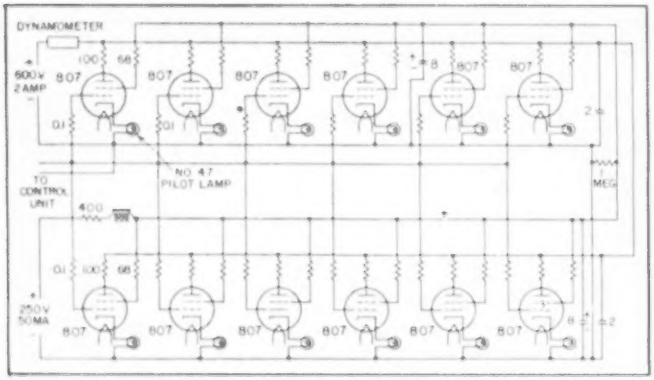


FIG. 4—Dynamometer amplifier, using 12 identical pentode tubes in parallel to provide an output current that follows the control signal despite high inductance of dynamometer field coils

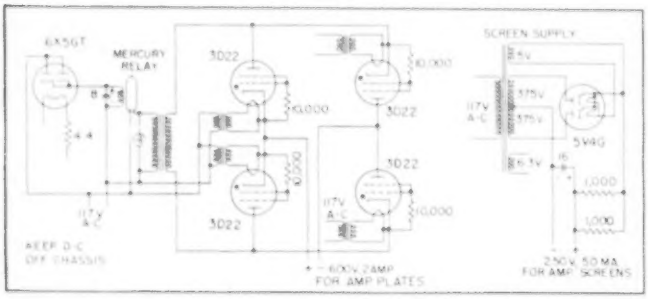


FIG. 5—Power supply circuits for amplifier and control unit. Filament heating time of 6X5GT rectifier provides time delay for application of plate voltage to gas rectifier tubes in full-wave bridge arrangement

velocity signal and an electronically obtained first derivative for the acceleration signal. With this general type of arrangement, shown in Fig. 2, it was possible to simultaneously reproduce the actual speed-vs-time and load-vs-speed curves in the laboratory. The device is essentially a closed servo-system in which a speed-sensitive generator on the test engine shaft feeds a signal to the control circuit which drives the amplifier to supply field current for the dynamometer which sets the speed of the test engine. The tachometer generator is a 3-phase, 4-pole a-c type which provides a voltage directly proportional to speed. The dynamometer is the eddy-current type in which the power is absorbed as heat from the iron structure by circulating water. Any other type of dynamometer which requires d-c field excitation, such as a resistance-loaded d-c generator, should also be applicable. In this case the d-c field excitation varies with the speed and acceleration of the test engine and is supplied by the dynamometer amplifier. The control circuit converts the a-c tachometer speed signal into a d-c control signal for the dynamometer amplifier.

Three-Channel Control Circuit

Since the load on a car at any instant is a summation of the velocity or resistance load and the acceleration or inertia load, the control similarly has a velocity and an acceleration channel. These two channels, plus a third error channel, are similar in design. Type 6V6GT tubes are used in a cathode-follower circuit as in Fig. 3 to provide a low-impedance output for type 6X5GT full-wave rectifier tubes. The rectifier is followed by a π-section filter to remove ripple. The filter section must be of extremely short time constant to prevent subjecting the signal to appreciable time delays. Small capacitors, low-resistance chokes and high-resistance loading satisfactorily limit the time delay.

The output of the velocity channel is a high-impedance direct voltage proportional to engine speed. Since acceleration is the first derivative of velocity, a voltage representing the acceleration can be obtained by differentiating the

velocity voltage. The output of the derivative circuit of the acceleration channel, consisting of a capacitor and resistor in series, should then be a high-impedance direct voltage proportional to engine acceleration. The error channel provides a high-order derivative signal which actually precedes the acceleration signal, counteracting the slow response of the highly inductive dynamometer field at the start of the acceleration run, enabling the dynamometer torque to approach more closely the ideal response indicated by line *A-B* in Fig. 1.

A type 6J5GT tube operating at reduced filament voltage converts the summation of these high-impedance voltages to a low-impedance signal for the dynamometer amplifier. An additional circuit provides negative control bias to the dynamometer amplifier. The diodes load the derivative circuits to prevent their becoming negative and unloading the amplifier when the velocity slope reverses. An output is provided to operate an Esterline-Angus recording milliammeter from the tachometer generator. This instrument automatically plots the speed-vs-time diagram, helpful in adjusting the control.

Twelve 807's in Parallel

The design of the dynamometer amplifier, which converts the control signal to dynamometer field current, is complicated by the high value of inductance of the dynamometer field winding, approximately 90 henrys. To overcome the effect of this inductance the output (field) current must follow the control signal, whereas amplifier circuits generally produce an output voltage to follow the control signal. A pentode amplifier tube has the required output current characteristic. A high-power amplifier was therefore constructed using twelve type 807 tubes connected in parallel as in Fig. 4. A pilot light in series with each tube indicates failure or abnormal operation.

The power supply circuit, shown in Fig. 5, is a full-wave bridge using four type 3D22 grid-controlled rectifier tubes to deliver 600 volts at 2 amperes unfiltered. This tube was selected for its low-voltage, high-current characteristic and the control feature is not used. Filtering is unnecessary in a plate supply for pentodes operating with a well-filtered screen supply. The screen supply uses a 5V4G cathode-type rectifier to delay the application of screen voltage while rectifier and amplifier filaments are heating. A novel time-delay relay, utilizing the filament heating time of a type 6X5GT rectifier tube with a mercury relay, satisfactorily controls the plate voltage.

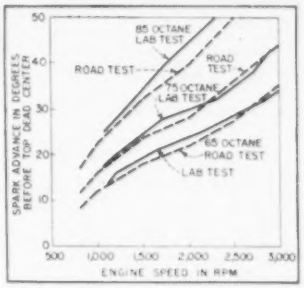


FIG. 6—Correlation of knock-rating curves obtained on road and with electronic control system in laboratory

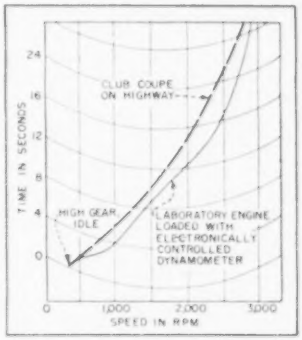

CLUB COUPE ON HIGHWAY
HIGH GEAR IDLE
LABORATORY ENGINE LOADED WITH ELECTRONICALLY CONTROLLED DYNAMOMETER
TIME IN SECONDS
SPEED IN RPM

FIG. 7—Correlation of acceleration curves obtained for 1941 Chevrolet club coupe on road and with engine alone in laboratory

Operating Adjustments

In developing this device, a speed-vs-time (acceleration) curve was first obtained with an automobile on the highway operating at full throttle, the recording milliammeter being operated from a tachometer generator on the distributor shaft.

Adjustments are provided on the control unit to allow the use of any automotive engine and body style with any dynamometer. The order of these adjustments is as follows: (1) Adjust bias to proper low-speed load with velocity channel set at 50 percent, other channels at zero; (2) adjust velocity channel to limit ultimate speed of engine to proper value; (3) adjust acceleration channel to give proper time duration to acceleration curve; (4) adjust error channel to eliminate rapid acceleration at start of run. Some readjustment of all controls may be necessary. In general, the velocity loading affects the high-speed end and acceleration loading affects the low-speed end of the curve.

The device was developed to simulate knock testing using the Borderline[4] method in which the car is accelerated from 10 mph to 70 mph in high gear at full throttle and the speed at which knock dieout occurs is recorded. With this equipment it has been possible to evaluate fuels rapidly in the laboratory using standard road-test procedures. Figure 6 shows the correlation of laboratory and road-test data. Much of the deviation between curves is due to operator judgment in determining when knock dies out, hence the correlation shown can be considered excellent.

Figure 7 is an automatic plot of the acceleration curve. The laboratory curve, as shown, would represent some lighter body style than the club coupe used on the highway for comparison.

The device described has possible further applications. Since the engine with this electronic loading device will always have its correct road load, it is possible by simple variations of throttle position with time to provide any desired type of cyclic operation. Thus it is now possible to simulate stop-and-go city driving in the laboratory.

The author wishes to express appreciation for the cooperation of Shell Oil Company in supplying roadtest data, and in particular to F. B. Rolfson of this company for suggesting the power amplifier circuit.

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(2) ASTM Manual, "Engine Test Methods for Rating Fuels", p 21, 1948.
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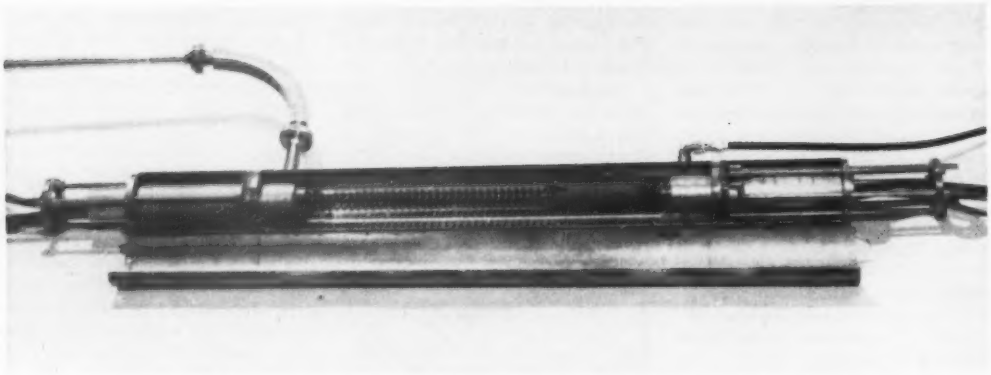

Attenuator at right end of glass envelope suppresses oscillations in 1,000-watt power amplifier

1,000-WATT

By STANLEY E. WEBBER
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SEVERAL PAPERS have been published describing the t-w principle, analyzing performance on a small-signal basis and noise characteristics.

Because of the large bandwidth and high gain characteristics of the traveling-wave tube, it has been considered desirable to investigate its potentialities as a power amplifier in the high frequency bands.

Description

Preliminary considerations indicated that information about operation of traveling-wave tubes at a power output level of about a kilowatt and frequencies in the 450-megacycle region might be useful. As a point of departure a tube was designed for operation at a beam voltage of 4,000 to 5,000 volts and beam current of about one ampere. An efficiency of about 20 percent would be necessary for the desired power output. The computed gain was of the order of 10 db.

A one-inch spiral was formed from $\frac{1}{8}$-inch diameter nickel tubing wound $2\frac{1}{2}$ turns per inch 20 inches long. The electron beam diameter is between $\frac{3}{8}$ and $\frac{1}{2}$ inch for a beam current of one ampere at beam voltages between 2,500 and 5,500 volts and a magnetic field of 1,000 gauss.

Details of tube construction and circuit arrangement are shown in Fig. 1. For operation at the kilowatt level it was thought necessary to provide for water cooling of the spiral. The arrangements for the water-cooled spiral are shown in Fig. 1A.

The r-f energy is coupled to the spiral from the usual coaxial line through a section of concentric line on the axis of the spiral. The spiral is simply attached directly to this center conductor at its edge. The r-f transition between a 50-ohm coaxial line and the spiral can be made with little reflection at the center frequency, with the bandwidth limited by the choke piston. The electron gun and necessary water connections for the spiral and water-cooled collector are inside of the concentric line sections.

A simplified tube and circuit arrangement can be provided when the spiral is cooled by radiation.

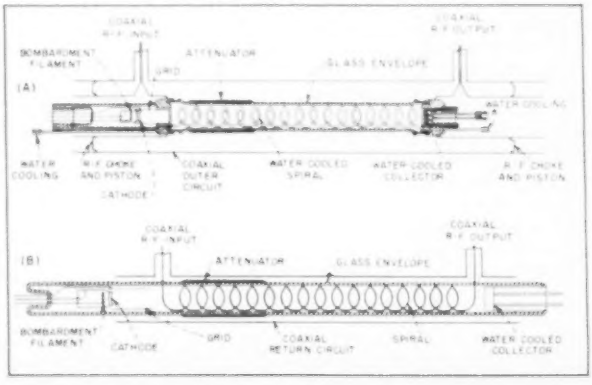
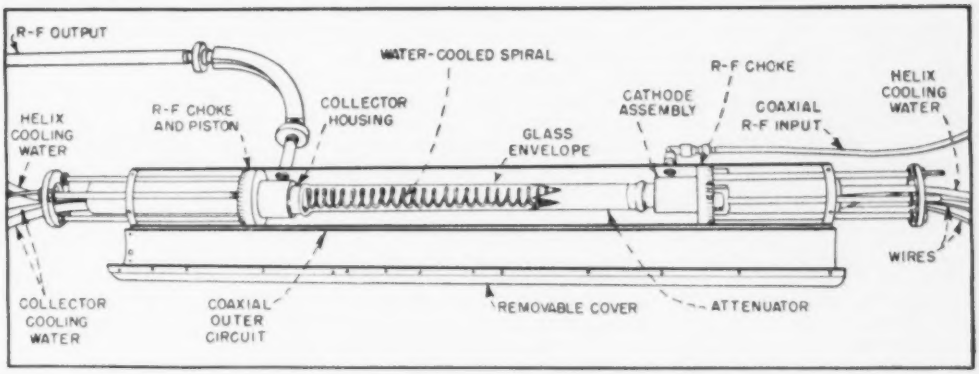


FIG. 1—Construction details of both types of traveling-wave tubes

This article is based on a paper presented by the author at the 1949 National Electronics Conference in Chicago. The conference paper will appear in the N.E.C. Proceedings.



In the 1,000-watt tube, both the spiral and collector are cooled by a continuous flow of water

Traveling-Wave Tube

Water-cooled 450-mc tube used as power amplifier produces power gain in the order of 25. Efficiency is 20 percent when tube is operated with 5,000 volts at one ampere. High performance is made possible by proper use of attenuation to suppress oscillations

The tube and circuit shown in Fig. 1B have been operated at a power output level of 500 watts. The r-f power is coupled to the spiral by making a right-angle bend in the spiral and bringing the conductor out radially through the glass to become the center conductor of the external coaxial line. This provides a fairly satisfactory broad-band transition as shown by the standing-wave-ratio curve in Fig. 2A. Further alterations of the circuit geometry at the transition point have reduced the standing-wave ratio to a low value in the 450-megacycle region.

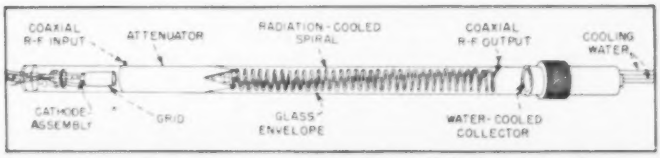
Attenuation

In order to suppress oscillations and stabilize the tube it is necessary to apply attenuation. This attenuates waves reflected at the output which would cause oscillations. Various means of achieving attenuation have been used. Among them are methods where the attenuators are applied uniformly along the length of the tube or concentrated in a short distance near the center of the tube. The material is usually a thin evaporated coating of metal or layer of Aquadag, applied on the inside of the glass in order to be close to the spiral.

Because of a geometry which permits a great radial penetration of the spiral fields it has been found possible to obtain sufficient attenuation by applying a conductive coating to the outside of the glass envelope. This has permitted extensive testing of the effect of the attenuation on the performance of the tube.

Figure 2B shows the variation of attenuation with d-c surface resistivity, a parameter which is proportional to thickness of material. It is observed that there is a point of maximum attenuation at about 1,500 ohms per square for Aquadag and 8 ohms per square for platinum. Also note that the peak attenuation

Radiation-cooled spiral tube, capable of 500 watts output at 450 mc



Input and output connections are brought out radially from the spiral

is less for platinum than for Aquadag.

The dependence of attenuation on frequency is shown in Fig. 2C. The attenuation is maximum in the 400-mc to 500-mc region. It has been found that most materials tested have about the same sort of frequency dependence, giving maximum attenuation in the 400-mc region. However, Aquadag has given the most attenuation per unit length.

Direct reflections from the attenuator are an important consideration in determining what sort of attenuation to use. A component of loss suddenly introduced on a uniform transmission system will introduce reflections. Also, in the case of the spiral the finite conductivity of the attenuating film tends to shift the currents and fields from the low-velocity spiral direction to the faster axial direction and thus distort the electromagnetic fields in the attenuating region. Figure 2D shows the standing-wave ratio, as measured by a probe coupled lightly to the spiral, caused by the abrupt transition between the unattenuating region and a region of uniform attenuation. Platinum with a swr around 2.5 is not satisfactory without tapering. Aquadag with a swr of about 1.2 is satisfactory for low-gain tubes. By tapering the Aquadag the standing-wave ratio has been reduced to less than 1.05.

The conducting sheet which is used for attenuation has an effect upon the velocity of the wave on the spiral. If the wave velocity in the attenuating region is materially different from that in the nonattenuating region, then the gain of the tube will be reduced, particularly if the attenuation is small.

The wave velocity in the presence of uniform attenuation has been measured. The schematic shown in Fig. 3A indicates the method used. The frequencies at which the phase of the wave through the tube was changed by 2π were determined by the null-point method. From this measurement and the geometry the velocity of the wave is computed.

The result of the measurement of velocity for Aquadag attenuation is presented in Fig. 3B. As the resistivity of the coating is decreased from a high value the wave velocity first decreases as it should simply from the introduction of some loss in the region. Then the velocity begins to increase rapidly to a value which should approach $v/c = 1$.

This increase is the result of a gradual shift from a wave which follows the spiral towards a direct coaxial mode. In the limit there would be a high velocity wave outside of the attenuator and a slow spiral wave inside. The point of minimum velocity corresponds roughly to the point of maximum attenuation. Thus at the operating point the wave velocity in the attenuating region is reduced by about 10 percent.

Operational Tests

Experimental work has shown that the most important single factor affecting performance at high power and efficiency has been the attenuator. Initially, tubes had been operated in the conventional manner using center attenuation. Figure 4A shows a typical curve of power output versus power input with saturation power occurring at about 100 watts output and efficiency of the order of eight percent. Wave velocity on the spiral with no space charge is $v/c = 0.11$, corresponding to a synchronous voltage of about 3,000 volts, while the operating voltage was between 3,700 and 4,100 volts. The variation of tube gain with beam current is illustrated in Fig. 4B. It will be noted that both low-level and high-level gains increase directly with current in the higher current regions.

In order to determine the effect on performance of the location of the attenuator, tubes were equipped with attenuators which could be moved axially while the tubes were in operation. The results of these experiments are shown in Fig. 4C. As the attenuator was moved toward the input end of the tube, with all other parameters held constant, the power output was observed to increase. The effect was more noticeable at high power input level where the tube was beginning to saturate than at low power input. The saturation power was approximately doubled when the attenuator

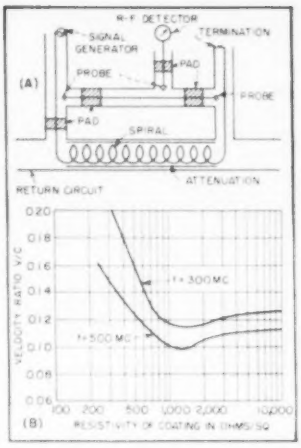


FIG. 3—Setup for determining velocity of waves on spiral is shown in (A). Curves in (B) show results obtained

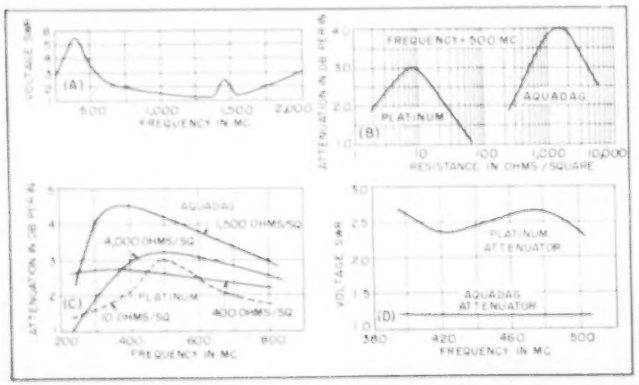


FIG. 2—The high performance from the t-w tubes described resulted from careful study of attenuation and standing-wave characteristics shown above

was moved from the center of the tube to the input end. Tubes with a short uniform attenuator starting directly at the input end of the spiral have operated satisfactorily with high efficiency and gain.

The second variable of importance is the amount of the attenuation used to stabilize the tube. The effect of this was investigated both by varying the length of the attenuator and also the conductance. The results indicate that any reduction in the amount of the cold attenuation results in an increase in saturation power.

The results of several experiments on several different tubes is shown in Fig. 4D, where saturation power is shown as a function of cold attenuation. Below 25 decibels the tube will oscillate, but at power saturation all of the r-f energy will be found at the driving frequency. In order to determine limiting efficiencies, tubes have been operated with no external attenuation and the amount of power output is correspondingly higher as indicated by the point on the curve at about 400 watts. This represents an electronic efficiency of the order of 25 percent.

It will be noted that attenuation can be decreased by decreasing resistivity of the coating. It was found that decrease in attenuation obtained by increasing thickness resulted in decreased power output and gain. Measurements of wave velocity described above (and indicated in Fig. 3B) show that for this range of attenuation wave velocity is greater than that in the unattenuated region. The decrease in gain in tubes using attenuators with conductivities in this range of values is attributed to this fact that velocities are quite different.

Most of the previously described work has been done with the tube (illustrated in Fig. 1B) with a spiral cooled only by radiation. Current intercepted on the spiral has been of the order of one or two percent with a magnetic field of about 1,000 gauss. This tube has operated satisfactorily at these power levels. The tube with a water-cooled spiral (shown in Fig. 1A) has been used at higher power levels. The gain and efficiency of this structure are not materially different from that of the uncooled spiral at the same current levels.

Tubes with a water-cooled spiral equipped with an attenuator at the input end have been operated at beam current up to 1.2 amperes. Figure 4E presents power output at saturation versus beam current and shows that power increases slightly faster than the beam current. Since the beam voltage is increasing slightly simultaneously, the power output increases about in proportion to d-c power in the beam and the electronic efficiency is about constant. Maximum power was 1,200 watts, at which point r-f heating of the glass limited further increase in power.

Bandwidth

Investigation of the frequency characteristics of the traveling-wave tube indicates that the spiral geometry has an important effect on bandwidth. For the particular tube described herein the frequency of maximum gain is about 500 mc and bandwidth about 100 mc within plus or minus 1.5-db variation in output. It is emphasized that this is an electronic bandwidth, measuring the relative coupling between the spiral and the electron beam, and does not include any bandwidth limitations due to the input or output coupling systems. The frequency of maximum gain is not appreciably affected by attenuation or by external circuit but only by spiral geometry.

Conclusions

It has been demonstrated that the traveling-wave tube operating as a power amplifier at medium power levels can be made to have conversion efficiencies which compare favorably with that of other beam tubes.

Unlike any device which depends upon a resonant structure for interaction with the beam the gain of the traveling-wave tube can be increased without a corresponding decrease in useful bandwidth. The inherent bandwidth is more than adequate for most commercial applications where wide transmission band is required.

The work described in this paper was supported by the Bureau of Ships, U. S. Navy.

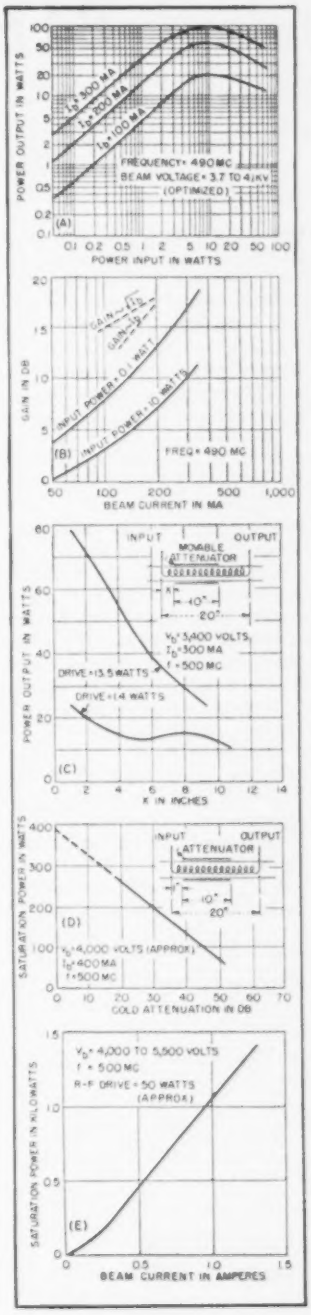


FIG. 4—Power output, gain and power saturation curves for the high-power water-cooled traveling-wave tubes under various conditions as derived by experimental methods

BIFILAR I-F COILS—

By S. R. SCHEINER

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BIFILAR COILS as interstage coupling devices in stagger-tuned amplifiers[1] provide a number of desirable features in addition to those of the conventional coupling system.

A bifilar coil may be defined as a transformer having as close to unity coupling as physically possible. The construction of a typical bifilar coil for use in the television i-f range from 21 to 26 mc is illustrated in Fig. 1. The coil shown is wound on a 0.292-inch O.D. Bakelite form using No. 30 wire with heavy formvar insulation.

The two windings are formed simultaneously, so that any turn on winding *A* is adjacent to two turns on winding *B*, thus insuring a high degree of coupling between coils. Measurements indicate a coefficient of coupling of approximately 90 percent. The insulation on the two windings is generally colored differently for convenience in wiring. The bifilar coil is tuned by a single iron core inside the form.

The use of bifilar coils in a typical television i-f system is illustrated in Fig. 2. This circuit represents a low-cost system employing only two i-f amplifier tubes and designed for a 3-db bandwidth of 2.2 mc and a 6-db bandwidth of approximately 2.65 mc. The three bifilar coils are labeled T_1, T_2, and T_3 in Fig. 2. The individual tuning frequencies and stage loading are based on the values determined by design formulas for an ideal stagger-tuned triple, and modified as required by practical considerations.

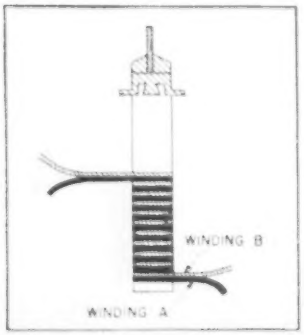

FIG. 1—Construction of bifilar coil

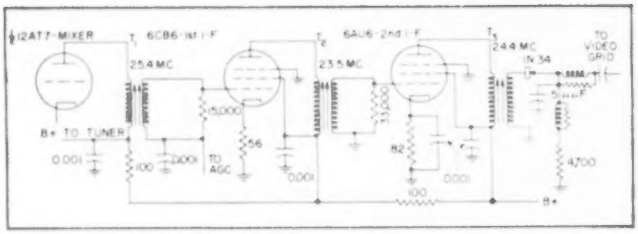

FIG. 2—Circuit of staggered two-stage i-f amplifier using bifilar coupling coils

A similar amplifier using single-tuned coils and coupling capacitors is shown in Fig. 3.

Economics

Comparison of Fig. 2 with Fig. 3 indicates that the use of a bifilar coil eliminates the necessity for a coupling capacitor in each stage. The added cost of winding the extra coil and providing the required insulation is approximately one cent. This is several cents less than the cost of an ordinary coupling capacitor, so that an appreciable cost saving is provided by the bifilar coil system.

An r-f choke is employed in Fig. 3 to feed B voltage to the last i-f tube plate, and the tuned-circuit coil is connected from video detector cathode to ground. Here, the resistance in series with the i-f plate must be low to avoid excessive drop in B voltage, and the resistance across the video detector load must be low to maintain diode detector efficiency. In this circuit, the use of a bifilar coil effects a further economy by eliminating the need for the r-f choke.

A second important advantage resulting from the use of bifilar coils is the improved noise immunity because of the low impedance in the i-f grid circuits. In the conventional amplifier illustrated in Fig. 3, where the d-c grid return is through the load resistor, an appreciable time constant in the grid may result. Noise pulses of sufficient amplitude to draw grid current will develop a charge on the coupling capacitor, and this charge will maintain bias on the tube until it can leak off through the grid resistor.

If bias is developed, the stage gain will be reduced after each noise pulse until the bias returns to normal. Severe noise may be sufficient to drive the tube to cutoff. The effect on the picture is that each noise pulse which modulates the carrier toward the black level is not itself very noticeable, but is followed by a white tail which is very objectionable.

In Fig. 3 the grid of the last i-f stage has a time constant of approximately 3.3 microseconds. The active time for one horizontal line is approximately 53.3 microseconds, so that severe noise would produce noticeable white streaking. When bifilar coils are employed, the grid time constant is virtually zero, so that the effect of noise on the picture is only to produce the black specks caused by noise modulation.

Improved noise immunity because of low grid time constant and economy in production due to the elimination of several components are achieved by use of bifilar coils between stages of stagger-tuned i-f amplifiers. Detailed analysis is given

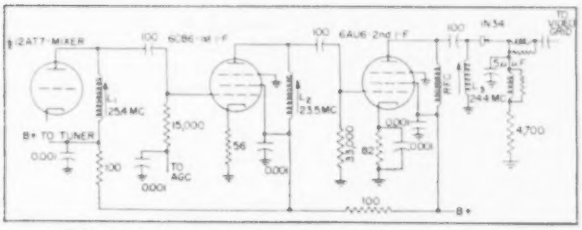

FIG. 3—Circuit of conventional single-tuned staggered stages

In the conventional single-coil system, the last i-f stages are the most susceptible to this effect because of the increased amplitude of noise pulses.

It becomes increasingly more difficult to use a resistor for the d-c grid return as the bandwidth of the amplifier is narrowed. This results from the fact that the individual stage loading, as prescribed by stagger-tuned design formulas, becomes less as the bandwidth is narrowed. Hence, the grid time constant becomes increasingly larger and the noise performance progressively poorer unless a bifilar coil or an additional choke is employed.

A higher i-f frequency would result in a longer grid time constant, since the increased tube transit time loading will necessitate less fixed loading to produce the desired stage bandwidth.

One alternative that might be suggested to reduce the grid time constant is to use a single-tuned coil in the grid circuit and feed B voltage through the loading resistor. This requires higher B voltage and greater power dissipation from the power supply components.

Comparison of Circuits

It is necessary to show that a tuned bifilar coil, as represented by Fig. 4A, is electrically equivalent to the single-tuned circuit of Fig. 4B, provided:—

$$L = \sqrt{L_1 L_2} \tag{1}$$

$$C = \sqrt{\frac{L_1}{L_2}}\,C_1 + \sqrt{\frac{L_2}{L_1}}\,C_2 \tag{2}$$

$$\frac{1}{R} = \frac{1}{\sqrt{\frac{L_2}{L_1}}\,R_1} + \frac{1}{\sqrt{\frac{L_1}{L_2}}\,R_2} \tag{3}$$

The equivalence of these two circuits can be most easily demonstrated by several successive applications of Thevenin's Theorem. Figure 5A is the same as Fig. 4A redrawn with a constant current generator source of energy added.

If we consider the internal and load circuits to the left and right of terminals 1 and 2, then the equivalent circuit according to Thevenin's theorem will be as shown in Fig. 5B where

$$E_A = \frac{i_s}{j\omega C_1} \tag{4}$$

$$Z_A = \frac{1}{j\omega C_1} \tag{5}$$

If we apply Thevenin's theorem to Fig. 5B, the equivalent circuit illustrated in Fig. 5C is obtained, where

$$E_B = \frac{E_A R_1}{R_1 + Z_A} \tag{6}$$

$$Z_B = \frac{1}{\frac{1}{R_1} + \frac{1}{Z_A}} \tag{7}$$

One more application of Thevenin's theorem results in Fig. 5D, where

$$E_c = \frac{-j\omega M E_B}{Z_B + j\omega L_1} \tag{8}$$

$$Z_c = \frac{\omega^2 M^2}{Z_B + j\omega L_1} \tag{9}$$

$$e_2 = \frac{i_2}{\frac{1}{R_2} + j\omega C_2} \tag{10}$$

$$i_2 = \frac{E_c}{Z_c + j\omega L_2 + \frac{1}{1/R_2 + j\omega C_2}} \tag{11}$$

Substitution and simplification will result in Eq. 12 provided k, the coefficient of coupling, is set equal to unity so that $M = \sqrt{L_1 L_2}$.

$$e_2 = \frac{-i_s}{\sqrt{\frac{L_1}{L_2}}\frac{1}{R_1} + \sqrt{\frac{L_2}{L_1}}\frac{1}{R_2} + j\omega\left(\sqrt{\frac{L_2}{L_1}}\,C_1 + \sqrt{\frac{L_1}{L_2}}\,C_2\right) + \frac{1}{j\omega\sqrt{L_1 L_2}}} \tag{12}$$

But Eq. 12 is recognizable as the equation for the response of a single-tuned circuit with the values set forth as in Eq. 1, 2 and 3.

In other words, a single-tuned circuit whose constants are so defined will be electrically equivalent to the bifilar coupling scheme. Hence, the bifilar coil will have the same selectivity curve as the equivalent single-tuned circuit and can be treated as such in the design of stagger-tuned amplifiers.

For the special case of a 1 to 1 transformer, $L_1 = L_2$, Eq. 12 becomes:

$$e_2 = \frac{-i_s}{\frac{1}{R_1} + \frac{1}{R_2} + j\omega\,(C_1 + C_2) + \frac{1}{j\omega L}} \tag{13}$$

This is the equation for a single-tuned coil of inductance $L = L_1 = L_2$, having the same input and output loading and capacities as the bifilar coil. In other words, a 1 to 1 bifilar coil will produce the same

selectivity curve and the same gain bandwidth factor as a single-tuned coil with the same capacitances and loadings.

If we consider once more the general case where L_1 is not equal to L_2, Eq. 12, then it can be shown that by selection of a proper ratio between L_1 and L_2, an improvement in gain-bandwidth factor over a single-tuned coil can be obtained provided the circuit input and output capacitances are unequal.

Consider the circuit in Fig. 6 where the coupling is 100 percent. Capacitance C_2 is greater than C_1 in the circuit. Let

$$A = \frac{N_1}{N_2} = \sqrt{\frac{L_1}{L_2}}$$

The stage gain from grid to grid is given by

$$\text{Gain} = \frac{g_m R_L}{A} \qquad (14)$$

and the bandwidth by

$$\Delta f = \frac{1}{2\pi R_L C_{eq}} = \frac{1}{2\pi R_L \left(C_1 + \frac{C_2}{A^2} \right)} \qquad (15)$$

then

$$\text{gain} \times \Delta f = \frac{g_m}{2\pi A \left(C_1 + \frac{C_2}{A^2} \right)} \qquad (16)$$

Equation 16 will be a maximum when

$A \left(C_1 + \frac{C_2}{A^2} \right)$ is a minimum which occurs

$$\text{when } \frac{d}{dA} \left[A \left(C_1 + \frac{C_2}{A^2} \right) \right] = 0 \qquad (17)$$

$$C_1 - \frac{C_2}{A^2} = 0 \qquad (18)$$

$$A = \sqrt{\frac{C_2}{C_1}} \qquad (19)$$

That is, maximum gain-bandwidth product will be obtained from such a coupling scheme when the turns ratio of the transformer is set equal to the square root of the capacitance ratio. Substituting this value in Eq. 16,

$$\text{Max gain} \times \text{BW} = \frac{g_m}{2\pi \left(2\sqrt{C_1 C_2} \right)} \qquad (20)$$

Compare this with the gain-bandwidth product for a single coil given by

$$\text{Gain} \times \text{BW} = \frac{g_m}{2\pi (C_1 + C_2)} \qquad (21)$$

When $C_1 = C_2$, the equations are equivalent and no advantage results from the bifilar coil. But if C_1 and C_2 are not equal, a bifilar coil will possess an advantage since $2\sqrt{C_1 C_2}$ will be less than $C_1 + C_2$.

If $m = C_2/C_1$, the advantage of a properly designed bifilar transformer over a single coil becomes greater as this capacitance ratio is increased. In an unpublished paper, H. Goldberg has shown the following relationship to exist between m, the circuit capacitance ratio and the gain-bandwidth advantage over a single-tuned circuit. These results can easily be checked by Eq. 20 and 21.

m	Gain-Bandwidth Ratio
2.0	1.060
2.5	1.110
3.0	1.155
4.0	1.250
5.0	1.340
15.0	2.005

The above analysis indicates that of two tubes designed to have the same figure of merit, the one possessing the greater inequality between input and output capacitances is the better tube, since it is possible by proper design to secure a higher gain-bandwidth product.

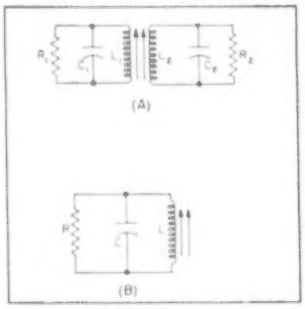

FIG. 4—Bifilar coil *A* is electrical equivalent of single-tuned coil *B*

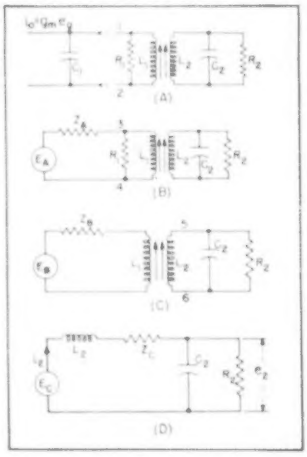

FIG. 5—Successive applications of Thevenin's theorem shows that single-tuned and bifilar-coupled circuits are equivalent

Turns Ratio

In a television i-f amplifier stage, the ratio between input and output capacitance depends primarily on the tube types employed. The capacitances contributed by tube sockets, leads, and coils can be minimized by careful design, but nothing further can be done. Tubes such as the 6CB6 and 6AG5 have a higher ratio of input to output capacitance than the 6AU6, but even their use would not provide a value of m greater than 2.

An increase in gain of only six percent could be obtained by increasing the turns ratio on the bifilar coil. To wind such a transformer is obviously more difficult and more expensive. Further, as the turns ratio is made larger, it becomes increasingly more difficult to maintain a high degree of coupling between coils. For these reasons, it has generally been found more feasible to use a 1 to 1 bifilar coil for interstage coupling in commercial television receivers.

In the output stage, however, a bifilar coil with a step-up turns ratio provides a very convenient method for transforming the video diode load until the operating Q of the last i-f circuit is correct. Here it is not possible to obtain the optimum value of gain-bandwidth product since the diode load resistor is determined by considerations of video response. If R_D represents the diode load resistor, the equivalent loading across the i-f tuned circuit is approximately

$$R_{eq} = \frac{R_D}{2\eta} \qquad (22)$$

where η is the efficiency of rectification[2].

In the circuit of Fig. 2, the diode load resistor, as determined by video design limitations, is 4,700 ohms. A practical value of diode efficiency is 50 percent. Then, by Eq. 22, the loading on the last tuned circuit is equivalent to 4,700 ohms. The bandwidth of this circuit, if a 1 to 1 transformer or a single coil

is employed, will be given by

$$\Delta f = \frac{1}{2\pi RC_T} \qquad (23)$$

where C_T = total input plus output capacitance, R = total equivalent shunt loading and the gain is given by $g_m R$.

In a typical practical amplifier C_T is equal to approximately 10 $\mu\mu$f. Then Δf = 3.4 mc.

The particular i-f system shown represents a stagger-tuned triple of over-all 3-db bandwidth equal to 2.2 mc. Stagger-tuned design formulas indicate that the broadest individual circuit shall have a 3-db bandwidth of 2.2 mc. The problem is not to obtain maximum gain × bandwidth, but to devise some means of narrowing the bandwidth from 3.4 mc to 2.2 mc, and then to obtain as much gain as possible with that bandwidth.

In Eq. 23 R and C_T are the parameters over which we have some control. The most obvious method for narrowing the bandwidth is by adding fixed capacitance. But Eq. 23 and the gain equation show that the effect will be to narrow the bandwidth without increasing the gain.

However, it is possible to narrow the bandwith by some matching device, and increase the gain somewhat at the same time. If a bifilar coil is employed, Eq. 3 indicates that the diode loading resistance is multiplied by $\sqrt{L_1/L_2}$. The tube plate loading is simultaneously reduced by a factor $\sqrt{L_1/L_2}$ but the plate loading resistance is so large that this effect is unimportant.

If the capacitance on the plate side of T_1 in Fig. 2 equals 8 $\mu\mu$f and that on the diode side equals 2 $\mu\mu$f, then the equivalent capacitance for Fig. 4B according to Eq. 2 is given by $C = 8N + 2/N$ where $N = \sqrt{L_1/L_2}$ and by *Eq.* 3 $1/R = 1/(4{,}700N)$. Therefore

$$\Delta f = \frac{1}{2\pi \times 4{,}700N \times \left(8N + \frac{2}{N}\right) 10^{-12}}$$

$$= 2.2 \times 10^6$$

$$N = \sqrt{1.68} = 1.30$$

That is, if the primary and secondary inductances have a ratio of 1.68 to 1, the video diode load will be transformed to produce the desired bandwidth of 2.2 mc. Then the gain = $g_m R$ = 1.30 × 4,700 g_m.

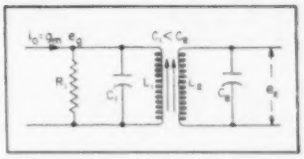

FIG. 6—Circuit with unequal capacitances and coupling of 100 percent

Hence, an increase in gain of 30 percent over that obtainable by adding shunt capacitance is realized through use of a bifilar coil.

The same impedance step-up, and consequent increase in gain, could be obtained by use of a suitable tapped coil or capacitance divider, but the bifilar coil is the simplest and most economical scheme.

Impedance Transformer

There are several other instances in the design of stagger-tuned i-f amplifiers where the use of a bifilar coil as an impedance transformer is desirable. For example, when the transit time loading of the tube itself becomes almost as large as the desired loading, the bifilar coil provides a simple means of decreasing this loading. One disadvantage of appreciable tube loading is poor noise immunity. Another disadvantage is that this loading varies between tubes, and therefore cannot be relied on to provide uniformity in production.

A bifilar coil enables the tube impedance to be stepped up and the circuit loaded with a close tolerance resistor, assuring uniformity of response. As mentioned previously, a narrow bandwidth and a high i-f frequency both result in the tube loading becoming appreciable. It is even possible in some amplifier design for the tube loading to exceed the desired circuit loading unless some step-up is employed.

Another instance where the circuit loading may exceed the required loading dictated by design considerations is the plate loading of a triode mixer. Here again, a bifilar coil of proper turns ratio may be employed to step up the mixer plate impedance, so that a fixed loading resistor can be used to insure circuit stability.

The bifilar type of construction lends itself most readily to a close wound assembly. Hence, the coil Q obtained is not as high as a space-wound single coil, but Q's of the value of 70 are obtained with no difficulty, and this is sufficient for most applications.

As the turns ratio between windings is increased, the difficulty of obtaining coupling approaching 100 percent is also multiplied. Also, the winding process itself becomes more difficult and expensive. All of the previous derivations were based upon the assumption that 100 percent coupling existed between the coils. If a high degree of coupling is not present, the bifilar coil is no longer equivalent to a single-tuned circuit, so that more than one resonant frequency may result. Coils having a step-up ratio as high as 1.30 to 1 have been tried with no difficulties.

A final limitation of the use of bifilar coils is the fact that they preclude the usual method of neutralization of grid to plate capacitance. Where the i-f is high, and the stage gain and grid to plate capacitance large, it may be necessary to provide neutralization of the grid-to-plate capacitance to avoid the dis-symmetry of the response curve resulting from feedback. In an i-f amplifier, this neutralization is usually provided by choice of a proper value of common plate screen bypass capacitor that enables balancing a capacitance bridge which prevents the feedback of output voltage (plate to screen) to the input terminals (grid to ground). Hence, the plate voltage is prevented from coupling back to the grid and the tube grid to plate capacitance is effectively neutralized.

When a bifilar coil is employed, the r-f voltage developed across the bifilar coil primary is effectively shorted across one leg of the bridge by the bifilar secondary and the balance is no longer maintained. In other words, the screen of the tube is effectively grounded by the secondary of the transformer, so that neutralization by this method is impractical.

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Automatic Control of High-Vacuum Systems

Accessory incorporating new circuits shows order of magnitude of vacuum by light panel and exact pressure by meter when used in conjunction with an ionization gage. Already in use as cyclotron beam-current indicator, the device has other remote-control potentialities

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Collins Radio Company
Cedar Rapids, Iowa

THE IONIZATION GAGE accessory described here was developed as a fully automatic circuit for measurement and control of high-vacuum systems.

After the initial adjustments are made, no attention from the operator is required. The device is particularly suitable for use with large and complex vacuum systems such as those of cyclotrons and other nuclear machines, vacuum furnaces and continuously pumped vacuum tubes. In addition to providing automatic control of all the functions directly associated with the operation of the ionization gage itself, the new circuit provides for interlocking with other circuitry.

Pressure indication can be provided at a multiplicity of remote points. The output circuit is powerful enough to drive an ink-writing recorder.

Pressure Indication

The pressure in the vacuum system is indicated on a large meter, calibrated directly in millimeters of mercury. This meter has an approximately logarithmic scale. It reads from 0 to 10, giving nearly constant percentage reading accuracy regardless of pointer position. The appropriate multiplier is indicated by the illumination of one of a group of panel lights, engraved with markings running from $\times 10^{-7}$ to $\times 10^{-3}$. The pressure is read by multiplying the meter reading by the multiplier indicated on the panel light. The front panel of the indicator unit shows the meter with its logarithmic scale and the panel lights with their multipliers.

This method of presentation relieves the operator of the necessity for manipulating a range-switch to obtain his readings. No confusing calculations are required to interpret the readings. The order of magnitude of the pressure is indicated by the multiplier lights. They can be observed from a distance and show immediately whether the vacuum is good or bad.

An automatic scale-changing mechanism acts to adjust the sensitivity of the indicator to keep the meter reading between 6 percent and 100 percent of full scale at all times. This mechanism simultaneously illuminates the panel light bearing the appropriate multiplier.

*Now with Varian Associates, San Carlos, Calif.

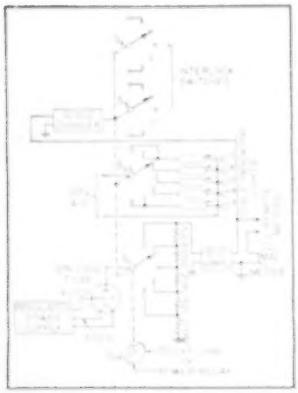


FIG. 1—Functional diagram of the automatic ionization gage circuit

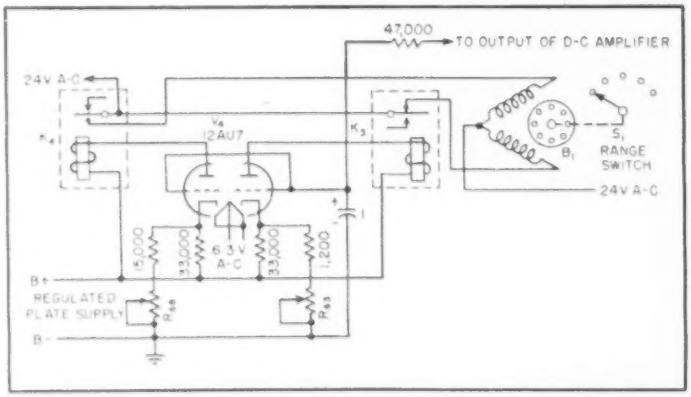
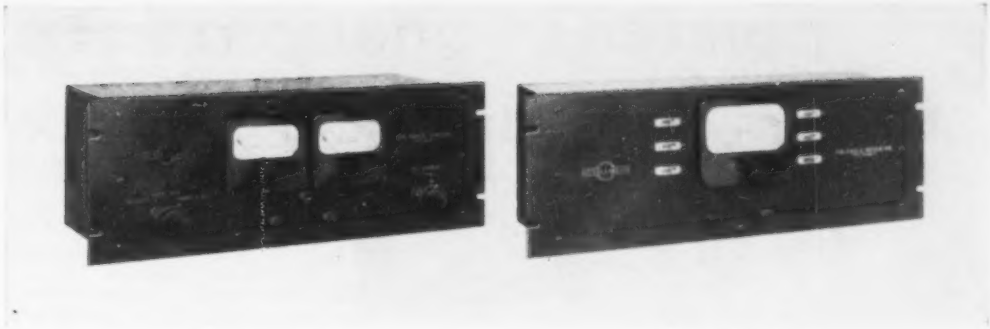


FIG. 2—Automatic scale-changer circuit prevents off-scale operation of the indicating meter without attention from operator



Ion-gage control unit

Ion-gage indicator unit

Additional contacts are provided on the range switch for external interlock purposes.

The amplifier that actuates the indicating meter has sufficient power output to drive a number of remote indicating meters (to a total of 500 ohms, 10 ma full scale). The range indicator lights may be multipled, so that complete pressure data are available at the remote points. The ion gage may be turned on and off, or switched from INDICATE to BAKE at a remote indicator if desired. Alternatively, one may use a portion of the output of the indicator amplifier to drive an ink-writing device to make a permanent record of prevailing vacuum conditions.

The automatic scale-changing mechanism is particularly well suited for interlock functions involving the control of other apparatus at predetermined pressure ranges. Two banks of contacts are provided on the range switch for this purpose, and are wired to terminal strips at the back of the indicator unit. These switches may be used directly or with supplementary relays either to permit or prevent operation of other apparatus. This arrangement can be set up to operate within any factor of ten (or combination of factors of ten) in pressure. As an example, a vacuum furnace could be so arranged that the heaters cannot be turned on until a pressure of 10^{-4} is attained, and will be turned off if the pressure rises to 10^{-3}.

An auxiliary contact is provided on the power relay. This can be used to prevent turning other equipment on when the ion gage is off.

Should the pressure go above 10^{-3}, the highest value indicated by the meter, the circuit will automatically turn itself off, thus preventing damage to the ion gage as well as to any equipment controlled by the gage circuit. The circuit will also turn itself off if the apparent pressure goes below 6×10^{-6}. This provision is incorporated since it is most unlikely that the pressure will ever get that low in any system in which this circuit will be used. A complete vacuum failure, or loss of emission in the ion gage, will cause the pressure apparently to go below this value. Since this is an abnormal situation, the circuit is arranged to turn off both itself and associated apparatus.

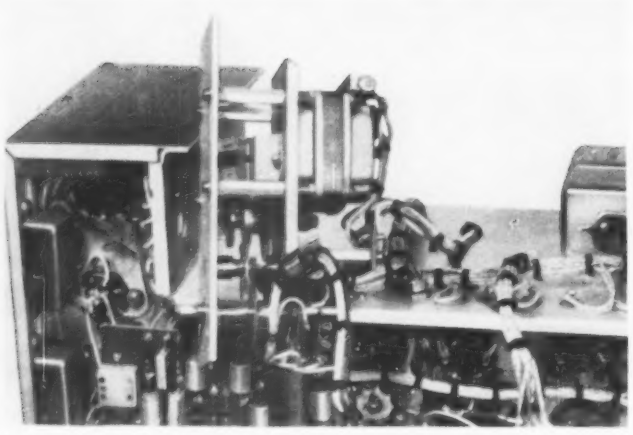
Operation

All the voltages and currents applied to the ion gage tube are electronically regulated. Thus, the only operating controls required are the ON and OFF pushbuttons that control the power unit. For convenience of assembly and installation, the indicator unit with its amplifier, indicator lights and scale changer motor is mounted on the panel. The control unit carrying power supplies, regulating circuits and power relays is mounted on a separate panel. Only the control unit is turned on and off; no power switch is provided on the amplifier unit, which has its own power supply. It is turned off only during prolonged periods out of use. The sensitivity of the amplifier unit is constant within 2 percent after a 30-minute warmup. It is independent of line voltage changes between 105 and 120 volts. No zero setting is required of this carrier-type amplifier; by the same token it is free from zero drift.

The control unit includes two meters on its front panel. They show respectively the filament current and the grid current in the ionization gage. The grid current is adjusted to a predetermined value to make the indicator readings correct. A knob is provided to adjust the grid current to a value appropriate to the gas being measured. The filament current meter is convenient for maintenance; excessive filament current indicates that the gage tube is inactive and should be replaced.

A switch on the control unit panel switches the instrument from indicate to bake conditions. The switching is accomplished by means of relays to permit control of this function from remote points as required. Indicator lights on the front panel inform the operator when the bake operation is in progress. During bake the grid current meter is removed from the circuit and power is removed from the scale-changer motor. The indicator amplifier is also removed from the circuit, so the indicator reads zero during the bake operation.

Figure 1 shows a block diagram of the instrument, as designed for use with a Western Electric D-79510 or D-79512 ionization gage tube. The reader is referred to Spangenberg[1] for a discussion of



Motor, gear train and Geneva gear used in the scale-changer, showing interconnection with electronic equipment

the theory of pressure measurement with the ionization gage. The filament, grid and anode voltages for the ionization gage are supplied from the control unit. The grid and anode (ion collector) voltages are regulated by means of voltage regulator tubes. The filament voltage is controlled by a well-known circuit[1] that adjusts the temperature of the filament to the value required to maintain the emission (grid) current constant at a predetermined value. The power unit thus maintains the sensitivity of the ion gage constant independent of changes in line voltage or filament emissivity.

The current to the ion gage anode is proportional to the pressure when the emission current and electrode voltages are held constant. However, the current corresponding to 10^{-5} mm Hg is only 0.01 microampere. A very sensitive d-c amplifier is required to produce such a pressure indication on a rugged meter. This amplifier with its power supply is contained in the indicator unit. It is a carrier-type using a vibrating reed to produce 60-cycle a-c proportional to the d-c input. This alternating current is amplified by a conventional four-stage amplifier, the output of which is rectified by a second vibrator operated synchronously with the first. The output circuit of this amplifier is capable of handling 10 ma into a 500-ohm load, and thus can operate any number of indicating or recording meters up to a total of 500 ohms. Each, of course, must have 10-ma full-scale sensitivity.

The automatic scale-changing is accomplished by a motor-driven rotary switch. The photograph shows the mechanism. A small split-phase reversible motor drives a Geneva motion through an appropriate gear train. The Geneva wheel is designed to advance the rotary switch one point for a full turn of the driving wheel. The switch itself is standard. One wafer, S_{1a}, is used to control the range indicator lights, while the two others, S_1 and S_{1b} are wired to terminals at the back of the units where they can be used as desired for interlock purposes. The voltage divider on the amplifier input is switched to the appropriate setting by S_1. Wafer S_{1c} is wired in series with the OFF pushbuttons. Its function is to remove power from the unit when the pressure rises above 10^{-4} or falls below 6×10^{-6}.

The schematic diagram, Fig. 2, shows the circuit that controls the scale-changing motor. The output voltage of the amplifier is applied to the two grids of a 12AU7 double triode. The scale-changing relays K_1 and K_2 are in the two plate circuits of this tube. The two operating points are independently adjusted by cathode resistors R_{16} and R_{17}. Normally K_1 is operated, K_2 is not operated and the motor B_1 is stationary. When the output meter reads full scale, K_1 operates and the motor runs in the direction to increase the attenuation of the input network. The motor continues to run in this direction until an on-scale reading is obtained.

When the indication on the output meter goes below 0.6 (this is 6 percent of full scale), K_1 releases and causes the motor to run in the opposite direction to increase sensitivity. The motor continues to run in this direction until the reading becomes larger than 0.6.

This simple circuit makes certain that the meter never goes off-scale and never goes below 6 percent of full scale. The meter scale is approximately logarithmic above 10 percent of full scale, giving approximately constant fractional reading accuracy at all parts of the scale.

Other Applications

The indicator unit described above is essentially a microammeter with one millivolt drop and a maximum full-scale sensitivity of 0.1 microampere. In the indicator unit this microammeter has been calibrated in millimeters of mercury for operator convenience. This same amplifier and scale-changing mechanism, calibrated in microamperes, will measure any direct current between 0.01 microampere and 1 milliampere without any setting of range switches by the operator.

The other features—indication at remote points and interlocking with other circuits, are retained when the instrument is used as a microammeter. These features have proved valuable in connection with cyclotron operation, where this instrument has been used as a beam-current indicator.

The writers wish gratefully to acknowledge the support that this project received from W. W. Salisbury, Director of Research, Collins Radio Company, without which it could not have been completed. Also, S. G. McNees contributed considerably to the design and was active in supervising the construction of the first models.

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Frequency Division with Phase-Shift Oscillators

Divisions as high as seven are easily obtained with standard component parts requiring only initial adjustment. Practical circuits described are customarily employed to obtain accurate power frequencies. They find additional use in the lower-frequency stages of frequency standards calibrated at r-f

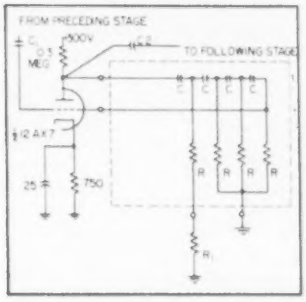

FIG. 1—Basic divider circuit illustrates importance of couplings

By CHARLES R. SCHMIDT

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THE resistance - capacitance phase-shift oscillator has desirable charactertistics as a frequency divider. When suitably modified, it is possible to obtain relatively large division ratios that are unaffected by tube replacement, component drift due to aging or temperature. The single triode used per division gives it an advantage over conventional multivibrator types. In operating latitude it approaches that of the inductance-capacitance oscillator.[1] It is advantageous in that the transformers are replaced by resistance-capacitance networks as frequency-determining elements, with a consequent reduction in cost and weight.

Dividers operating from both crystal and tuning-fork oscillator standards have been constructed to give dependable 60-cycle output for motor drive applications. Divisions by five, six and seven were used in these designs. Scale-of-ten divisions in a single stage have also been used. They require more care in initial alignment because of the restricted locking range.

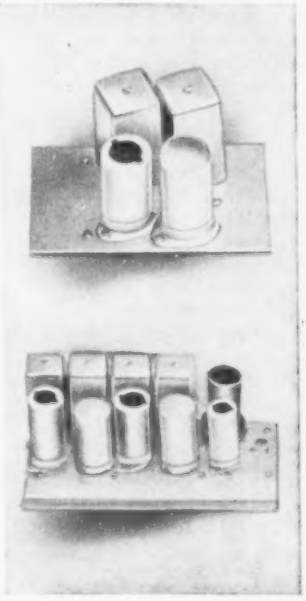
The resistance-capacitance phase-shift oscillator is particularly applicable in divider chains where the output frequency is below 10 cycles. In this frequency range, other dividing methods are undependable or require components of large size.

The basic phase-shift oscillator used for frequency division is shown in Fig. 1. The circuit is the standard four-section, series-capacitance shunt-resistance type and was favored over the three-section type because less gain is required for oscillation. It is desirable at higher frequencies where the tube output capacitance decreases the stage gain. Departures from the standard oscillator are found in the use of capacitors C_1 and C_2 and in the operating point of the tube.

Capacitor C_1 couples the control frequency, which is some multiple of the output frequency, into the frequency-determining network. This capacitor serves the additional function of dropping the control voltage to a suitable value for proper operation. The magnitude of C_1 is such that it only slightly affects the frequency of oscillation of either stage.

Output is taken from the plate of the tube through an appropriate coupling capacitor C_2, either to the grid of the following divider stage, or into the output load resistance. Each stage oscillates with an amplitude of about 60 volts at the design-center supply voltage of 300 volts. The operating point of the tube determined by the plate and cathode resistors is such that strong harmonics of the oscillating frequency are produced. The control-frequency voltage combines with the harmonic that is nearest in frequency, causing the frequency of the oscillator to change to an exact control frequency submultiple.

A 100-cycle oscillator can be used as a divider of frequencies of 500, 600 and 700 cycles without modification, because fifth, sixth and seventh harmonics of the fundamental frequency are generated. When locking of the oscillator occurs, the control frequency de-



Two of the frequency dividers described. The upper one is based on 1,800 cycles and the the lower upon 90.72 kc

termines its frequency and the output wave shows a fundamental plus a pronounced harmonic at the control frequency. As the control frequency is varied the phase of this harmonic varies with respect to the fundamental wave. If the control frequency is changed sufficiently the divider will unlock. This effect is noticed in the ouput wave by the harmonic's continually changing phase with respect to the fundamental.

In Fig. 2 the locking range of a 100-cycle divider is shown as a function both of controlling frequency and magnitude of the capacitance C_1. In obtaining this data, the controlling frequency voltage was kept constant at 60 volts and applied to C_1 through a 100,000-ohm resistor to simulate the driving impedance of the preceding divider stage. The locking range is seen to be generally better for control frequencies that are odd multiples of the oscillator frequency than it is for those that are even multiples. When C_1 is small little of the control frequency energy is introduced into the oscillator and hence the locking range for a given division is restricted. When C_1 is made too large so much control frequency is introduced that the divider acts as an amplifier with the control frequency as output.

The locking range curves indicate that for the 100-cycle output divider a 250-$\mu\mu$f coupling capacitor from the previous stage will give the widest locking range for divisions by five and six, but a somewhat larger capacitor is required for divisions by seven for optimum operation. The locking range as a function of the phase-shift network resistance is shown in Fig. 3 for a 100-cycle oscillator. This curve was taken for a division by six and is indicative of the results obtained for other divisions.

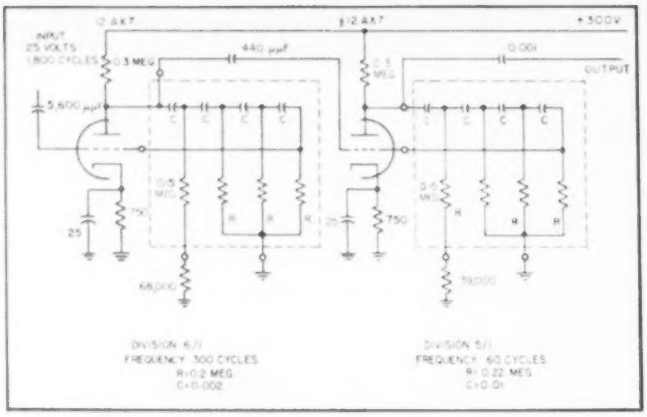


FIG. 4—Synchronous motor-control giving frequency division of 30

In designing a divider stage, the required oscillating frequency of the stage is determined, and the standard formula for the frequency of a four-section phase-shift oscillator is used,[3] making the R of the formula 200,000 ohms. In this way the required C is obtained. If the value of C determined in this way is not close to a standard value, a different R above 200,000 ohms can be chosen. Figure 3 shows that the operating range will only be slightly affected by this change of resistance.

It is usually required, when using standard-tolerance components in the phase-shift network that the frequency be adjusted by padding the first resistance in the network (shown as R_1 in the Fig. 1) to a suitable value. In the models constructed, the phase-shift resistors and capacitors of a stage are arranged in separate shield cans, indicated by the dotted lines. In practice, the first 150,000-ohm resistor is brought out to a terminal. The padding resistor R_1 completes the connection to ground.

Using the optimum values as determined by the foregoing, the operation of the divider is independent of supply voltage variations over a wide range. By setting the center of the locking range at the control frequency a supply-voltage variation of from 200 to 400 volts will not cause the divider to unlock. This stability results because the phase-shift oscillator's frequency is only slightly affected by supply voltage. The control voltage required to obtain locking is not critical.

The diagram of Fig. 4 shows a divider designed to give 60-cycle output controlled by an 1,800-cycle tuning-fork frequency standard. The first stage divides by six (300-

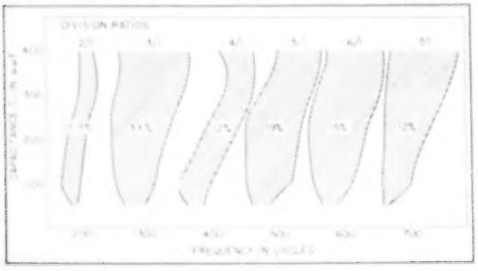


FIG. 2—Shaded areas indicate the locking range as a function of input coupling and frequency. Supply voltage is 300 v, frequency 100 cycles and resistance R is 200,000 ohms

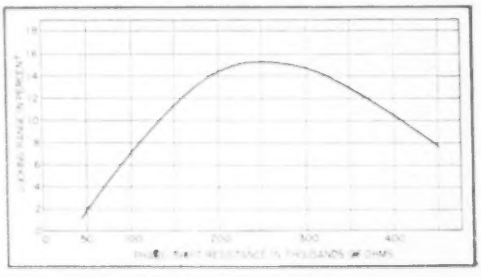


FIG. 3—Locking range in percent as a function of phase-shift resistance in thousands of ohms. The oscillator frequency used is 100 cycles and division ratio is six-to-one

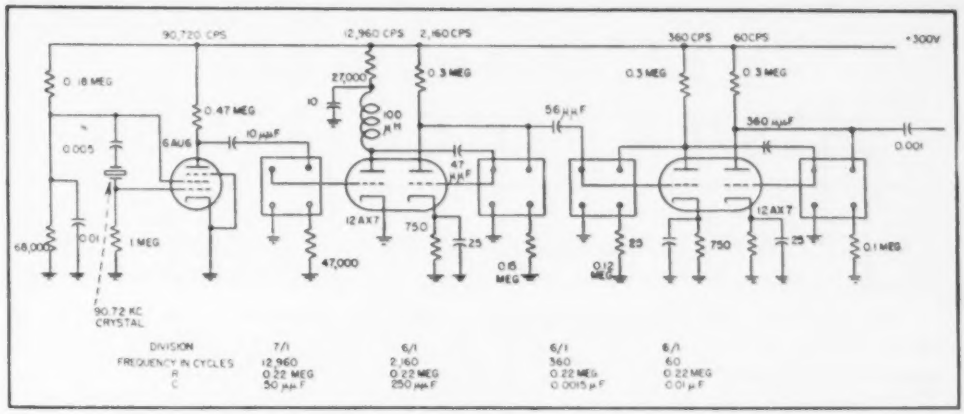


FIG. 5—Divider system using a 90.72-kc crystal gives highly accurate 60-cycle output

cycle oscillator) and the second stage by five (60-cycle oscillator). For a divider of this type, employing two divisions of a low order, standard-tolerance components of the values shown will produce satisfactory lock-in between the oscillators.

In order to insure stable operation despite variations in the oscillator frequencies with time, the frequency of each stage should be adjusted for the center of the control range. In practice, when the incoming 1,800-cycle frequency is applied to the vertical plates and the output from the plate of the first stage to the horizontal plates of an oscilloscope, a six-loop Lissajous figure is observed. By replacing R_1 with a resistance box its value can be adjusted so that the divider will unlock for a high value of resistance and also for a low value. A value is then chosen to give the midfrequency between these two drop-out points. By transferring the oscilloscope connections to the next stage, the procedure can be repeated to place the divider in final adjustment.

Range	Percent	Mid-frequency
1,645-1,895	14.1	1,770
1,671-1,947	15.2	1,809
1,669-1,931	14.6	1,800
1,668-1,932	14.6	1,800
1,656-1,932	15.3	1,794
1,694-1,945	13.7	1,819

This divider gave a control range of 15 percent when operated from a 25-volt control-frequency input. The tabulation shows the variation in locking range of the overall divider for six random-choice 12AX7 tubes.

The results indicate that for each tube there is ample latitude for frequency drift of the oscillators around the 1,800-cycle midfrequency.

A frequency standard with 60-cycle output controlled from a 90.72 kc crystal is shown in Fig. 5. Terminal connections, only, to the phase-shift circuit-blocks are shown. The R-C values, division ratios and oscillating frequencies of the dividers are indicated. There is one notable exception in this design. An inductive plate load is used in place of the usual resistive load in the first divider stage. The fundamental frequency of this oscillation is 12,960 cycles with a 90.72-kilocycle seventh harmonic.

The usual plate-load resistance of 300,000 ohms together with the plate-cathode capacitance of the tube reduces this harmonic to a level where satisfactory locking cannot be obtained. A 100-millihenry powdered-iron-core inductance provides the necessary high plate impedance together with sufficient peaking effect to insure the high-frequency response of the stage. The use of the inductive plate load requires that the operating point be readjusted. It was done by using a resistance-capacitance plate-decoupling filter and eliminating the cathode resistor. The alignment procedure for this divider is the same as for the previous one. In operation the overall locking range was 12 percent which is determined by the 7-to-1 stage. The voltage limits for satisfactory operation were 200 to 400 volts.

Experience with R-C and L-C oscillators of various types as frequency dividers indicates the following general requirements: a frequency-determining network of appreciable Q; a distortion element that produces harmonics; and the combining of the control frequency with the appropriate harmonic and the injection of the resultant into the oscillating circuit. The Q will determine the locking range; the lower the Q the broader will be that range. Using high-Q oscillating circuits and good distortion elements, stable divisions by as high as 300-to-1 are possible in a single stage.[3]

In the divider described in this article, the phase-shift network provides the low-Q frequency-determining element for a broad locking range. The distortion is produced in the tube itself. Control frequency and oscillator harmonic are combined at the grid of the stage. In this way the phase-shift oscillator meets the requirements in an economical way, using a minimum of tubes and components.

References

(1) E. Norrman, The Inductance-Capacitance Oscillator as a Frequency Divider, *Proc. IRE* **34**, Oct. 1946.
(2) E. L. Ginzton and L. M. Hollingsworth, Phase-Shift Oscillators, *Proc. IRE*, **29**, Feb. 1941.
(3) M. Silver and A. Shadowitz, A High Ratio Multivibrator Divider, Federal Telecommunication Laboratories, Inc., Technical Memorandum No. 261, Feb. 1947.

Efficiency of MISMATCHED LINES

Nomographs relate power transfer ratio and efficiency of extremely short transmission line to vswr and attenuation, permitting quick determination of how much power actually reaches the transmitting antenna or other load

By H. M. SCHLICKE
Port Washington, New York

ENERGY TRANSFER by short transmission lines is often considered to be very close to 100 percent, on the assumption that the transmission line approximates an ideal non-dissipative line and the voltage standing-wave ratio (vswr) approaches 1. However, this idealization may lead to unanticipated marked differences, even for small deviations from the presumed conditions. If, for example, the load causes a vswr of 1.5 on a line that has an attenuation of only 0.5 db and if the input impedance of the line is matched to the output impedance of the generator, the efficiency is off 11.4 percent. If the generator output impedance were equalized to the

(continued on page 116)

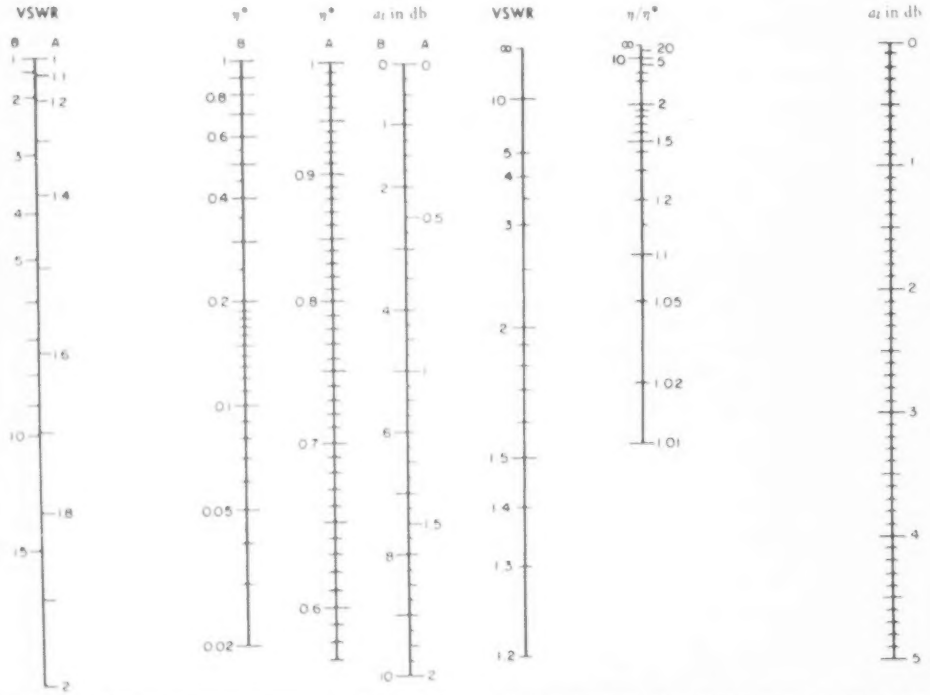


FIG. 1—Combination two-range nomograph for finding third value when any two are known. Use all three scales marked *A* together for lower ranges of attenuation *a* and vswr; use scales marked *B* together similarly for higher ranges

FIG. 2—Nomograph gives directly (center scale) the gain that can be obtained by matching the generator to the actual input impedance of the line, whereas nomograph of Fig. 1 is for matching generator to characteristic impedance of line

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Efficiency of Mismatched Lines (Continued from page 114)

characteristic impedance of the line, the efficiency of the line would drop to 85.9 percent. For measurement purposes, deviations of that magnitude are hardly negligible.

This situation deteriorates rapidly for increasing attenuation a_l of the transmission line and for higher vswr. Broadband loads fed over a certain length of transmission line may obtain power only in the order of magnitude of 10 to 50 percent. Electrically short transmitting antennas fed by relatively long transmission lines without matching transformers between antenna and cable may be supplied with far less than 1 percent of the power coupled in the line by the transmitter.

Except for very crude approximations, the efficiency of transmission lines should therefore be calculated and accounted for. The purpose of the accompanying nomographs is to simplify these calculations.

Definitions

The power transfer factor η_l^* holds if the generator output impedance equals the characteristic impedance of the line. With this premise, η_l^* is defined as the ratio of the power supplied to a mismatched load to the maximum power the power source can deliver to a matched load including transmission losses.

The actual efficiency η_l of the transmission line is the ratio of the load power to the power supplied to the input terminals of the line, and is independent of generator matching. The line input is identical to maximum generator power capacity, if generator output impedance and line input impedance are matched.

The factor η_l/η_l^* indicates the gain obtainable by matching the generator to the actual input impedance of the line, instead of matching to the characteristic impedance.

The vswr, unilaterally denoting the load, is measured at the load.

The attenuation a_l is the necessary and sufficient criterion for the transmission line.

It is assumed that the phase angle of the characteristic impedance of the line is negligible, since this condition holds for practically all transmission lines in use for power transfer.

The representation of the antenna in the cotanh diagram, or equivalently in a Smith chart, means that the antenna, or more generally the load, is substituted for by a hypothetical open-circuited transmission line possessing a certain attenuation a_s, so that vswr = cotanh a_s. In this and the following equations the attenuation is measured in nepers.

In terms of a_l and a_s, power transfer factor η_l^* and efficiency η_l as defined above are expressible as follows:

$$\eta_l^* = \frac{2 \sinh 2a_s}{e^{2a_l} + e^{2a_s}} \qquad (1)$$

$$\eta_l = \frac{\sinh 2a_s}{\sinh (2a_l + 2a_s)} \qquad (2)$$

$$\frac{\eta_l}{\eta_l^*} = \frac{1}{1 - e^{-(4a_s + 4a_l)}} \qquad (3)$$

Use of Nomographs

Figure 1 serves to read any one of the three determinants η_l^*, a_l and vswr, when two of them are known. It should be noted that only the scales with the same letter (A or B) are commensurable.

Figure 2 permits the finding of the multifunctional relation between η_l and η_l^*.

Though η_l can be determined by multiplying η_l^* (Fig. 1) and η_l/η_l^* (Fig. 2), Fig. 3 will often be more convenient. The two-letter designations of the center scales indicate the coordinated outer scales.

Examples

A transmitter with a variable output transformer and a capacity of 100 watts is available. The vswr at the load is 5. What maximum attenuation a_l of the line is tolerable, if 60 watts are required in the load? Answer: η_l = 60 percent, hence from Fig. 3 a_{max} = 1.15 db.

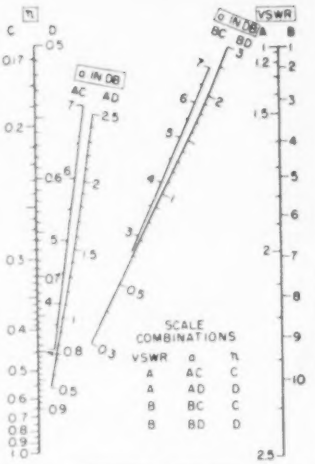

FIG. 3—Convenient four-range nomograph for determining efficiency of transmission line directly when attenuation and vswr are known. Use scales only in combinations indicated

A transmission line of 0.5 db attenuation feeds an antenna represented by vswr = 2. What is the antenna power relative to the maximum transmitter power, if (1) the transmitter output impedance equals the characteristic impedance of the transmission line, and if (2) line input and generator output are matched impedancewise? Answer: (1) from Fig. 1 η_l^* = 79.3 percent; (2) from Fig. 2, η_l/η_l^* = 1.1 and η_l = 87.4 percent. Note that η_l comes very close to η_{max} =89.2 percent, the latter being read from Fig. 1 or Fig. 3 for vswr = 1.

Under certain conditions the efficiency and power transfer factor seem to be considerably less than the values obtained from the nomographs. This is due to neglecting losses in the transmitter tuning and tank circuits; these losses must be calculated independently as they have no relation to the efficiency of the line itself.

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TUBES AT WORK

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Edited by VIN ZELUFF

Electrolytic Capacitor Test Set 118
The Front Cover 120
Receiver Circuits for Color Television 120
Circuits of Phonevision System 156
Time Scale for Watches 170

Electrolytic Capacitor Test Set

By Ricardo Muniz
Division Manager
Television Receiver Manufacturing Division
Allen B. DuMont Laboratories, Inc.
East Paterson, N. J.

LIFE TEST RUNS of electrolytic capacitors with specified values of d-c polarizing voltage and alternating ripple current can be made easily with the setup of Fig. 1, which permits testing up to six different batches independently. Each batch can have its own voltages, and failure of a unit in one batch does not affect the validity of tests for the other five groups.

Interaction between ripple current and polarizing voltage is prevented by using the basic circuit of Fig. 2. An overload relay disconnects the capacitor group safely when one fails during the usual 500-hour life test. The basic circuit was multiplied by six as in Fig. 1 to check up to six groups of six electrolytics at a time, enough to completely fill the heat oven used.

Ripple current is set at the desired value for a group by switching paper capacitors in or out. Unused capacitors in one group can be paralleled with those in another group calling for larger ripple current, by appropriately setting the master and group transfer switches. Polarizing voltages are changed with patch cords, which also permit applying only d-c polarizing voltages to other elements in the same electrolytic unit. Neon lights are connected across each fused circuit to indicate open fuses, and other pilot lights indicate the circuits that are in operation.

A reset switch, normally closed, permits releasing the overload relay to check if a short is temporary. A standard d-c power supply using five VR-105 regulator tubes in series provides the d-c polarizing voltages. The overload relay is adjusted to operate if direct current increases above the allowable leakage current value of the electrolytics under test. Extra contacts are provided on the relays to discharge both the ripple current-controlling capacitors and the electrolytics under test.

Whereas previously it took about

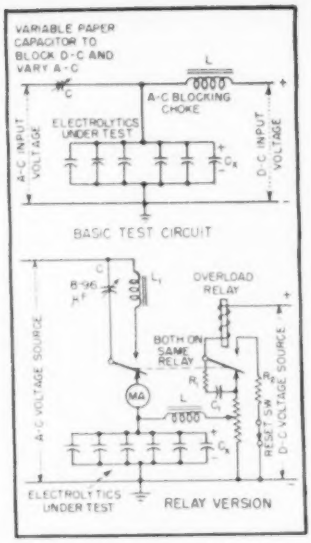


FIG. 2—Basic circuit used for life-testing electrolytics

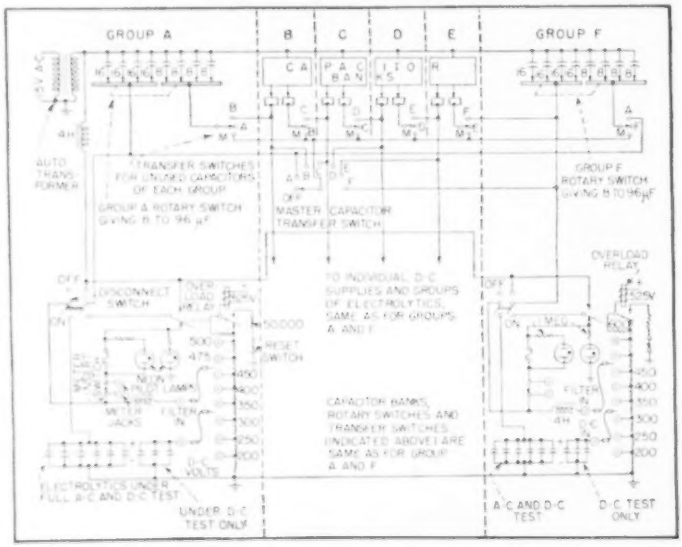
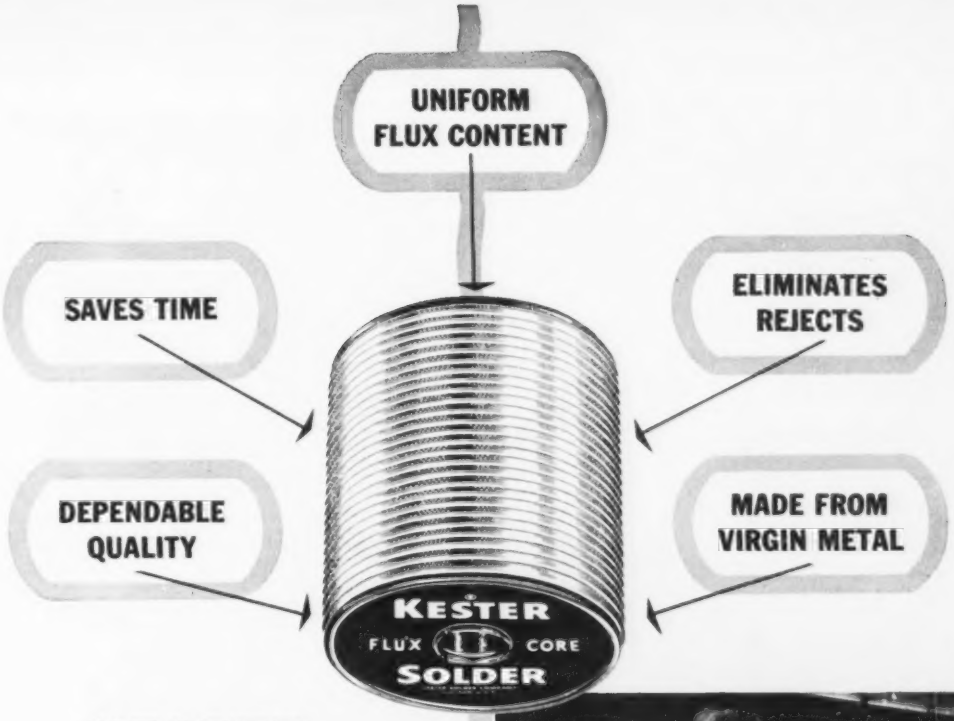

GROUP A
B
C
D
E
GROUP F
AUTO TRANSFORMER
TRANSFER SWITCHES FOR UNUSED CAPACITORS OF EACH GROUP
GROUP A ROTARY SWITCH GIVING 6 TO 96 μF
MASTER CAPACITOR TRANSFER SWITCH
GROUP F ROTARY SWITCH GIVING 6 TO 96 μF
DISCONNECT SWITCH
OVERLOAD RELAY
RESET SWITCH
TO INDIVIDUAL D-C SUPPLIES AND GROUPS OF ELECTROLYTICS SAME AS FOR GROUPS A AND F
CAPACITOR BANKS, ROTARY SWITCHES AND TRANSFER SWITCHES INDICATED ABOVE ARE SAME AS FOR GROUP A AND F
ELECTROLYTICS UNDER FULL A-C AND D-C TEST
UNDER D-C TEST ONLY
A-C AND D-C TEST
D-C TEST ONLY

FIG. 1—Test set for making life test runs of up to six groups of electrolytic capacitors, each at different values of a-c ripple current and d-c polarizing voltage that are set up on a jack panel. Temperature oven is used for electrolytic capacitors under test. Paper capacitor banks at top provide various ripple currents needed



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10 hours to set up a test and the entire test was invalidated when even one unit failed, setup time for 36 units now takes only about an hour. Operation is automatic, releasing for other duties the engineer who formerly had to watch constantly to prevent overloads in the power supplies due to shorts. Only an occasional glance at the pilot lamps is now needed.

Receiver Circuits for Color Television

RECEIVERS demonstrated recently to the FCC in Washington by RCA engineers employed two types of picture tubes; one contained a single electron gun and the other is a three-gun affair.

Both types have the same kind of direct-view color screen. It comprises an orderly array of small, closely spaced, aluminized phosphor dots arranged in triangular groups, each group consisting of a green-emitting dot, a red-emitting dot and a blue-emitting dot. In the laboratory sample tubes used in the demonstrations there are 351,000 such dots, 117,000 of each color.

In the three-gun tri-color kinescope, an apertured mask is interposed between the three guns and the dot-phosphor screen in such a manner that the electrons from any one gun can strike only a single-color phosphor no matter which part of the raster is being scanned. The mask is a sheet of metal spaced from the phosphor screen and containing 117,000 holes, or one hole for each of the tri-color-dot groups. This hole is so registered with its associated dot group that the difference in the angle of approach of the three oncoming beams determines the color. Three color signals applied to the three guns produce independent pictures in the three primary colors and the pictures appear to the eye to be superimposed because of the close spacing of the small phosphor dots.

In so far as the color aspects are concerned, this three-gun tri-color kinescope may be utilized in a re-

(Continued on page 150)

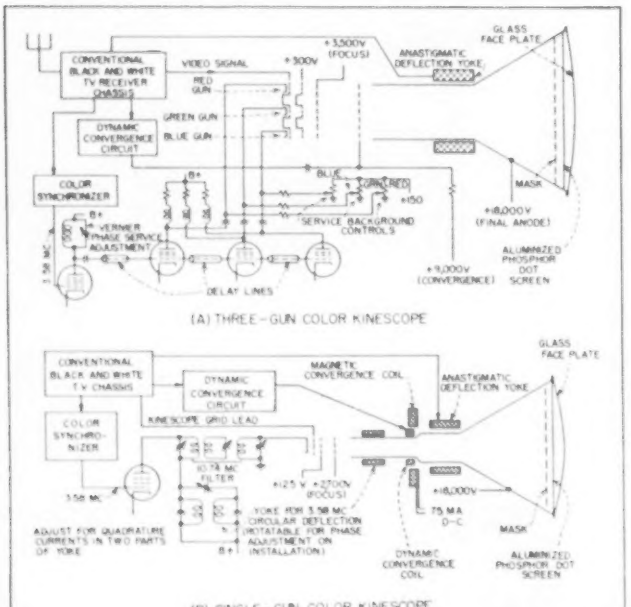
THE FRONT COVER

ELECTRON HEART of the new RCA 5831 is an array of 48 independent unit electron-optical systems arranged cylindrically in the tube. This construction, in effect, concentrates 48 triodes in relatively small space.

Each of the electron-optical systems consists of a filament in a slot in the beam-forming cylinder, grid rods and the copper anode. Electrons leaving the emitting surface of the filament are beamed between a pair of grid rods to the anode by the focusing action of the beam-forming cylinder.

Individual filament and grid elements of the unit triodes in the array are tungsten rods 8 inches long, supported at both ends by means of knife-edge V-notch arrangements. A pantagraphic mounting device has flexible spring-loaded fingers to which the filament rods are hooked. This makes each filament strand and grid rod mechanically independent, and allows vertical movement without disturbing the precise alignments and spacings essential to effective electron optics.

The accompanying photograph shows the anode-envelope assembly being lowered into position around the filament rods.



Circuit arrangements for the two types of RCA color picture tubes

Early American Gunsmith . . .

Arming the soldiers of "young" America was a formidable task for the new, untried nation. Each musket, the weapon of the day, was laboriously made by hand . . . and repaired by hand.

It was Eli Whitney, Massachusetts-born Yale graduate, who showed the way to improvement. In 1798, he undertook to supply the U.S. Army with the unheard of quantity of "10,000 stand of arms" to be delivered within two years—a commission beyond the imagination of the most skilled mechanists of the day. To do this Whitney developed the concept of interchangeable gun parts wherein "the several parts were as readily adapted to each other as if each had been made for his respective fellow." History shows that Eli Whitney succeeded and from this humble, little-remembered beginning the new era of mass production was underway.

In the electronic, radio, and electrical fields alone, Sprague has done much to arm *modern* America. Of some 10,000 different component design variations produced each year, many are produced by the millions. But most important, like Whitney's interchangeable weapons, each component of a given type maintains its particular characteristics to an outstandingly high degree of uniformity.

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THE ELECTRON ART

Edited by JAMES D. FAHNESTOCK

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Omegatron—A Miniature Cyclotron 122
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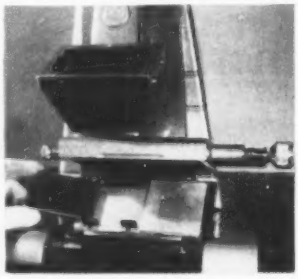
Survey of New Techniques 190

Permanent-Magnet Electron Microscope

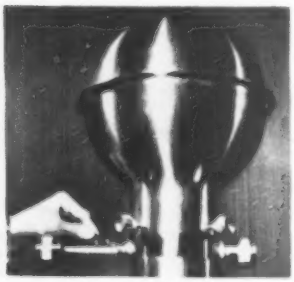
THE COST of the electron microscope has recently been radically reduced by the development of a permanent-magnet lens system. Heretofore, coils containing thousands of turns of wire, numerous cables and connectors, and a three-tube control circuit including several heavy and costly transformers were required for the electromagnetic electron microscope. Furthermore, the stability of the permanent-magnet lens is far superior to that of its predecessor.

The accompanying photographs illustrate several features of a packaged electron microscope using the permanent-magnet type lens system. It stands 30 inches high, weighs 50 pounds, and is capable of a resolving power of 100 Angstrom units with an accelerating potential or 50,000 volts. The image seen directly on the microscope viewing screen represents a magnification of 1,500, 3,000 or 6,000, depending on the lenses employed. When used in conjunction with photographic enlargement, magnifications up to 50,000 diameters can be obtained.

The knobs extending radially just below the high-voltage gun chamber facilitate positioning of the specimen under observation. Provisions are made for exposing photographic negatives directly. Focusing is controlled by varying the accelerator potential, since object distance and magnetic field strength are fixed in this type. Specimens are introduced into the electron beam by a special lock arrangement which preserves the vacuum.



Provisions are made for photographing submicroscopic particles



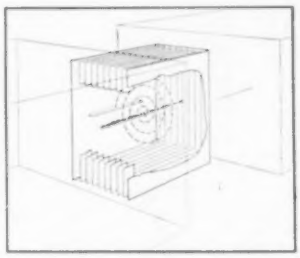
Specimens can be placed in the permanent-magnet electron microscope without disturbing the vacuum

The pumping system, which consists of two pumps in series, can evacuate the column in less than a half hour from a cold start.

The permanent magnet microscope was designed by Dr. J. Reisner, advance development engineer in the Scientific Instruments Engineering department of the Radio Corporation of America.

Omegatron—A Miniature Cyclotron

OPERATING on the same fundamental principle as the cyclotron, the recently developed omegatron has aided National Bureau of Standards scientists in making high-precision measurements of such electrical quantities as the numerical values of the faraday and the nuclear magneton. The omegatron, because of its high sensitivity, is expected to be helpful in many other branches of the field of measurements, such as gas and vapor analysis, and for the measurement of nuclear packing fractions (the excess of actual mass value over mass number for any isotope) which are of vital importance in atomic physics.



Cutaway drawing of the heart of the omegatron. Difference between applied r-f field and particle cyclotron frequency is inversely proportional to particle rotations before collision with central collector

The heart of the omegatron is little larger than a package of cigarettes. The present versions employ a rather bulky electromagnet, but a much smaller permanent magnet would serve as well and make the whole assembly desk-top size.

Operation

The functioning of the omegatron can be explained in terms of a simple physical law. If a charged particle is moving in a uniform magnetic field it will trace out a circular path. The particle's angular velocity ω_c about the center of the circular path is given by the so-called cyclotron equation $\omega_c = eB/M$, where e/M is the charge-to-mass ratio of the particle, and B is the magnetic flux density.

In the cyclotron this property

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SIGNAL GENERATOR
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Frequency Range 175—250 mc

The Type 202-D Signal Generator, developed to meet the specialized requirements of engineers working with telemetering receivers and other associated equipment, will be welcomed by many who have long needed a precise and reliable instrument for rapidly evaluating overall system performance.

SPECIFICATIONS:

RF RANGE: 175–250 megacycles in one range, accurate to ± 0.5%. Main frequency dial also calibrated in 24 equal divisions for use with vernier frequency dial.

VERNIER FREQUENCY DIAL: This dial is divided into approximately 100 equal scale divisions and is coupled to the main frequency dial by a 24:1 gear train. The approximate frequency change per vernier division is 35 kc.

FREQUENCY MODULATION (DEVIATION): The FM deviation is continuously variable from zero to 240 kc. The modulation meter is calibrated in three FM ranges (1) 0–24 kc., (2) 0–80 kc., and (3) 0–240 kc. deviation.

AMPLITUDE MODULATION: Utilizing the internal audio oscillator amplitude modulation may be obtained over the range of 0–50% with meter calibration points of 30% and 50%. By means of an external audio oscillator the RF carrier may be amplitude modulated to substantially 100%. A front panel jack is provided which permits direct connection of an external modulating voltage source to the final stage for pulse and square wave modulation. Under these conditions the rise time of the modulated carrier is less than 0.25 microseconds and the decay time less than 0.8 microseconds.

MODULATION CONTROLS: Separate potentiometers are provided for continuous control of FM and AM levels.

MODULATING OSCILLATOR: The internal AF oscillator may be switched to provide either frequency or amplitude modulation. It may also be switched off. Eight fixed frequencies between 50 cycles and 15 kilocycles are available, any one of which may be selected by a rotary type switch.

RF OUTPUT VOLTAGE: The RF output voltage is continuously variable over a range from 0.1 microvolt to 0.2 volts at the terminals of the output cable. The impedance of the RF output jack, looking into the instrument, is 53 ohms resistive.

DISTORTION: FM: The overall FM distortion at 75 kc. is less than 2% and at 240 kc. less than 10%.
AM: The distortion present at the RF output for 30% amplitude modulation is less than 3% and for 50% AM less than 6.5. At 100% the distortion is 12% to 15% depending upon the modulating frequency.

SPURIOUS RF OUTPUT: All spurious RF output voltages are at least 25 db. below the desired fundamental. Total RMS spurious FM from the 60 cycles power source is down more than 50 db., with 75 kc. deviation as a reference level.

EXTERNAL MODULATION REQUIREMENTS:
Frequency Modulation: The deviation sensitivity is 50 kc. per volt. For external FM the input impedance is 1500 ohms.
Amplitude Modulation: Approximately 45 volts are required for 50% modulation and 100 volts for 100% modulation. For external AM the input impedance is 7500 ohms.
Audio Voltage for External Use: There is available at the FM external oscillator binding posts about 5 volts a.c. maximum and at the AM external oscillator binding posts, 50 volts maximum.

DIMENSIONS AND WEIGHT: Outside cabinet dimensions: 17" high, 13½" wide, 11½" deep. Weight: 35 pounds.

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FREQUENCY MODULATED SIGNAL GENERATOR · BEAT FREQUENCY
GENERATOR AND OTHER DIRECT READING INSTRUMENTS

Close-up view of omegatron. In operation glass tube is lowered between jaws of electromagnet

makes it possible to accelerate charged particles to extremely high velocities. In the omegatron, however, it is used to discriminate between particles of different masses; the heavier particles will have a lower angular velocity. Measurement of ω_c with the aid of accurate frequency standards and measurement of B by means of nuclear resonance methods provide an absolute determination of e/M in terms of the magnetic field strength and the cyclotron frequency alone.

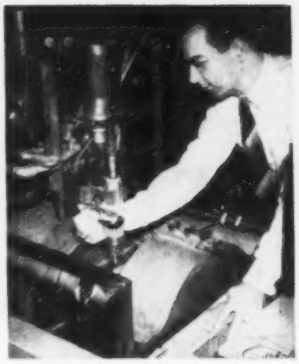
In addition to the constant and uniform magnetic field, the omegatron employs a radio-frequency electric field applied at right angles to the magnetic field. When the angular frequency of the electric field is ω, a charged particle will revolve in a plane perpendicular to the magnetic field at an angular velocity of $\frac{1}{2}(\omega + \omega_c)$. If the radio frequency differs from the cyclotron frequency, the radius of the ion path will periodically increase and decrease. The radius of the path traced out by the ion is then

$$R = \frac{K}{\omega - \omega_c} \sin \frac{\omega - \omega_c}{2} t$$

where K is a constant that depends in part on the strength of the r-f field and t is time. When the two frequencies are close together, the maximum radius of the path will be larger than when they are more widely separated, and when the frequencies are equal (in resonance) the radius of the path will increase steadily and the ion will spiral outward from the center. A collector placed at a fixed distance from the center of rotation of the ions will give maximum ion current at resonance.

Resonance in the omegatron is quite sharp and can be determined very precisely. The degree of sharpness of this resonance condition is described as the resolution and is defined as the width of the resonance peak at its base (expressed in cycles per second) divided by the center frequency of the peak. Resolution is proportional to the number of revolutions an ion makes before striking the collector. For greatest resolution, the ions must be held in the omegatron as long as possible. A trapping field produced by a positive potential applied to a set of guard rings retards axial loss of the ions. With the aid of this trapping field, ions are held for more than a millisecond so that they have time to complete thousands of revolutions before being collected.

Resolution increases as the r-f voltage is lowered, but the accompanying decrease in ion current at the collector places a limit on the attainable resolution. The omegatron has yielded resolutions as high as 1/14,000 at unit atomic mass, with strong indications of still higher resolutions to come. The extreme sensitiveness of the omegatron permits operation with very small samples. A wide range of operating pressures is possible; excellent resonance peaks have been obtained at pressures of the order of 10^{-7} millimeters of mercury.



Omegatron is shown as part of a mass analyzer

Bandspreading Resistance-Tuned Oscillators

By Seymour Barkoff
Senior Engineer
Emerson Radio and Phonograph Corp.
New York, N. Y.

ONE COMMON characteristic of most audio signal generators is the crowding of the calibration markings on the frequency dial toward the upper end of the audio frequency spectrum. Such crowding usually causes difficulty in interpolating frequency readings accurately between dial markings. Occasionally, the need arises for greater accuracy and precision in frequency readings.

It is the purpose of this article to describe a simple means of adding bandspread to a particular laboratory oscillator. Sufficient design information will be included to make the method applicable to other oscillators of the same general type, and for any desired frequency ranges.

Theory

The audio oscillator selected for the job was the Hewlett-Packard Model 200B, which consists of a two-tube audio oscillator and a two-tube feedback amplifier. Only the oscillator circuit is dealt with here, since the amplifier circuits are unaffected by the bandspread revision.

The basic circuit of the two-tube oscillator is shown in Fig. 1. The circuit resembles that of a multivibrator, except for the method of feeding grid and cathode of the 6J7 stage. Oscillations take place at a

(Continued on p 172)

2-WAY RADIO'S **Greatest VALUE!!** **TODAY and TOMORROW**

with exclusive **SENSICON RECEIVER - NOW AVAILABLE** *in the Dispatcher.*

PERMANENT VALUE of ADVANCED DESIGN

The Sensicon Circuit with the Permakay Wave Filter, Statomic Oscillator, Differential Squelch, Capacitance Discriminator, and Thermally Balanced Crystal Oven, all exclusive Motorola developments, has advanced the art to permit practicable adjacent channel operation. Further, it provides the only uncompromised design capable of accepting full modulation on the desired channel, and adaptable to "split-channel" frequency assignments. With *"Instantaneous Deviation Control"* of the transmitter carrier plus the broad nose, steep skirt characteristic of the Sensicon Receiver, you have an advanced design combination which will give superior performance *now and tomorrow!*

RELIABILITY

Put it in and forget about it! It breezes along with peak performance always. With fixed-tuned, sealed circuits, precision compensated elements, quality components and workmanship—the day of radio tinkering is over! Remember! the Sensicon System is *coasting* while ordinary systems using fewer tubes are taxed to the false-economy limit!

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Built for quick and easy installation—with full accessibility, *here is the solution* to any mounting problem in any type of vehicle. Choice of new all-in-one front model, or trunk mount unit—both are drawer-type with quick lift cover. Both units provide for complete metering and antenna alignment through the covered ports on front—yet the complete housing is closed against dust or other foreign particles.

ENDURING ECONOMY

A quality communications unit designed to deliver longer sustained service at the lowest operating cost. New single vibrator power supply provides for minimum tube and vibrator replacement.

FREEDOM FROM OBSOLESCENCE

The growth of land mobile services licensees from 5,000 in 1945 to over 17,000 (over 160,000 transmitters) today indicates that channel-splitting is imminent. With adjustable modulation control, I.D.C., and exclusive exchangeable Permakay filter you have every factor in hand for your future protection.

Motorola

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MADE BY THE WORLD LEADERS IN 2-WAY MOBILE RADIO BACKED BY 20 YEARS RESEARCH, EXPERIENCE, AND SPECIALIZATION IN MOBILE RADIO

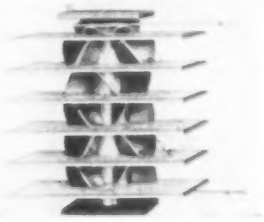
NEW PRODUCTS

Edited by WILLIAM P. O'BRIEN

Military Needs Influence Size, Weight and Composition of Components . . . Benefits to TV Service Engineers Seen in Variety of Test Apparatus . . . Thirty Items Available Trade Literature Are Reviewed

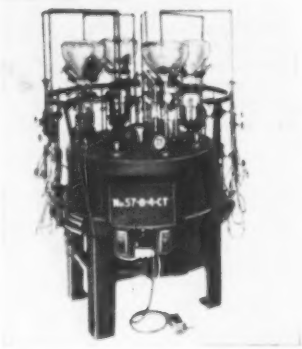
Electron Microscope

RADIO CORP. OF AMERICA, Camden, N. J., Type EMP table-model permanent-magnet electron microscope provides useful magnifications up to 50,000 diameters. Because it employs a 50-kv accelerating potential it is effective for studying thick specimens. Using permanent-magnet lenses it needs no stabilization circuits and controls. The unit features a resolving power to 100 angstrom units. Price is $5,750 and deliveries will begin in September.



Selenium Rectifiers

SARKES TARZIAN INC., 415 N. College Ave., Bloomington, Ind., has announced the Centre-Kooled selenium rectifiers designed for use in radio, television or electronic equipment. The center cooling feature provided by a special spacer between the cells insures lower overall operating temperatures by allowing air to reach the portions of the cells in which the current density is the greatest. Sixteen models are available in the standard line ranging from units rated at 65 ma at 130 volts to units capable of handling 450 ma at 130 volts.



Sealing-In Machine

EISLER ENGINEERING CO., INC., 750 South 13th St., Newark 3, N. J. Model 57-8-4-CTL four-head sealing-in machine adaptable for sealing the electron gun to the bulb can handle up to 24-inch diameter video tubes in the range of 90 per hour. It is powered by two motors (½ h-p and ¼ h-p) for adjusting independently the index head and head drive respectively. The machine is automatically operated by a reset timer which stops the turret from rotation for a predetermined time which ranges from 0 to 60 seconds.

Electrostatic Generators

CHATHAM ELECTRONICS CORP., 475 Washington St., Newark 2, N. J., is producing two electrostatic generators of 6 kv and 20 kv, designed to replace cumbersome and short lived batteries as a high-voltage supply for Snooperscopes, Sniperscopes and similar infrared sighting equipment. The unit (illustrated above right, as compared with the older type shown on the left) weighs only 10 pounds, is powered by a spring motor and operates indefinitely. A variable speed governor provides constant speed which results in constant current output rather than constant voltage. Constant voltage output is maintained with a corona discharge regulation tube.

Adjustable Potentiometer

A. F. SMUCKLER & CO., INC., 202 Tillary St., Brooklyn 1, N. Y. The Vari-Function nonlinear potentiometer comprises a helical resistance and a plurality of taps that can be quickly adjusted to produce or reproduce any desired voltage indication or output as a function of angular displacement. It produces any form of voltage function with better than 0.5-percent accuracy. Some of its many typical applica-

ANOTHER *New* RAYTHEON SUBMINIATURE

THE CK5829 TWIN DIODE

TO PROVIDE YOU WITH

1. High perveance (performance compares favorably with that of the larger 6AL5)
2. Low heater current (150 ma.); half as much as the 6AL5
3. Moderate cost

RAYTHEON *Subminiature Tubes* have long been standard throughout the world. More of them are in commercial use than all other makes combined. They assure *greater product salability* due to size reduction — *greater convenience* because they fit standard sockets or can be soldered or welded into the circuit, and because over half a million are available from stock; over 300 Raytheon Tube Distributors are at your service — *greater dependability*, backed by unsurpassed technical resources and a dozen years of production and application experience with long-life Subminiature Tubes.

— NEW TYPES

This chart gives you at a glance the characteristics of representative Raytheon Subminiature Tubes

Type No.	Remarks	Maximum Diameter Inches	Maximum Length Inches	Filament Or Heater Volts	Filament Or Heater Ma.	Mutual Conductance μmhos	Power Output M.W.	TYPICAL OPERATING CONDITIONS Plate Volts	Plate Ma.	Screen Volts	Screen Ma.	Grid Volts
HEATER CATHODE TYPES												
CK5702 CK5702CX	Characteristics of 6AK5	0.400	1.3	6.3	200	5000		120	7.5	120	2.3	Rk = 200
CK5703 CK5703CX	Triode, UHF Oscillator, $\frac{1}{2}$ watt at 500 Mc	0.400	1.3	6.3	200	6000		150	9.0			Rk = 220
CK5704 CK5704EX	Diode, equivalent to one half 6AL5	0.315	1.3	6.3	150			150 pv	9.0			
CK5744 CK5744CX	Triode, High mu	0.400	1.3	6.3	200	4000		250	4.0			Rk = 900
CK5784	Characteristics of 6AT6	0.400	1.3	6.3	200	3300		120	5.2	120	3.5	−2.0
** CK5829	Similar to 6AL5	0.285±0.385	1.3	6.3	150			117 pv	5.0 per section			
FILAMENT TYPES												
1A24	RF Pentode	0.285±0.385	1.9	1.25	100	2000		45.0	2.4	45.0	0.6	Rk = 3meg
2E51-32	RF Pentode for pocket radio	0.500±0.400	1.56	1.25	50	500		22.5	0.4	22.5	0.3	0
2E32-36	Output Pentode for pocket radio	0.285±0.385	1.7	1.25	50		4	45.0	0.47	45.0	0.15	+1.25
2E47-42	Diode Pentode for pocket radio	0.350±0.400	1.56	1.25	50	375		22.5	0.35	22.5	0.12	0
2G51-53	Triode Heptode for pocket radio	0.290±0.410	1.56	1.25	50	475 conv. cond.		22.5	0.20	22.5	0.30	
1R5†	Duo Triode, Fast Radio Combo	0.500	1.81	1.4	50			45.0	1.5	Special Circuit		
CK5726A	Double Source Charge Remote Amplifier	0.285±0.412	1.25	0.625	75	1100 both units		45.0	0.56			0
CK5725A	Low microphonic voltage amplifier	0.285±0.385	1.25	0.625	25	375		22.5	0.125	22.5	0.04	+0.625
CK5762A	Output Pentode 25 ma. Filament	0.285±0.385	1.3	1.25	25	425	1.2	22.5	0.30	22.5	0.08	0
CK5744A	Output Pentode	0.285±0.385	1.3	1.25	25	500	2.2	22.5	0.45	22.5	0.125	+1.75
CK5756A	Output Pentode	0.285±0.385	1.3	1.25	25	525	2.2	22.5	0.45	22.5	0.06	+1.2
CK5764A	Output Pentode	0.285±0.385	1.3	1.25	25	425	0.75	22.5	0.45	22.5	0.12	+1.5
CK5726A	Output Pentode 150 ma. Filament	0.285±0.385	1.5	1.25	15	225	0.75	22.5	0.15	22.5	0.025	0
CK5726A	Sensitive Output Pentode	0.285±0.385	1.5	1.25	25	550	1.6	15.0	0.32	15.0	0.075	+1.25
CK5726A	Output Pentode	0.285±0.385	1.5	1.25	15	400	1.6	22.5	0.36	22.5	0.09	0
** CK5744A	Voltage Amplifier	0.285±0.385	1.25	0.625	75	300		15.0	0.0047	12.0	0.0014	−0.625
CK5726A	Output Pentode	0.285±0.385	1.5	1.25	25	550	1.6	15.0	0.32	15.0	0.075	+1.25
CK5726AX	Diode Pentode	0.285±0.385	1.5	1.25	25	550		22.5	0.19	22.5	0.142	0
CK5726AX	RF Pentode	0.285±0.385	1.5	1.25	50	550		22.5	0.42	22.5	0.10	0
CK5726A	150 ma. Filament Counterpart (see Gp. 1, 2A12 - amps. max.	0.285±0.412	1.5	1.25	15	1.81		15.0	0.20	Triode Conn.		+2.5
CK5726A	Triode, High Frequency output	0.285±0.385	1.5	1.25	200	2200		90.0	11.0			+4.5
CK5744A	Shielded Pentode RF Amplifier	0.285±0.385	1.25	0.625	75	1100		22.5	0.125	22.5	0.04	+0.625
CK5672	Output Pentode	0.285±0.385	1.5	1.25	50	450	4.5	67.5	3.25	67.5	1.1	+4.5
CK5675 CK5726AX	Triode, UHF Oscillator	0.285±0.385	1.5	1.25	200	1600		135.0	4.0			+2.0
CK5677 CK5726AX	Triode, UHF Oscillator	0.285±0.385	1.5	1.25	80	650		135.0	1.6			+4.0
CK5678 CK5726AX	RF Pentode	0.285±0.385	1.5	1.25	80	1100		67.5	1.6	67.5	0.48	0
CK5677 CK5726AX	Electrometer Triode Mod. of 2 current (see Gp. 1 amps.	0.285±0.412	1.25	0.625	30	1.31		12	0.22			+4.0
CK5785	High voltage rectifier	0.285±0.412	1.5	1.25	15				0.1	Inverse peak 3500 volts		
** CK5869	2.5 ma. Filament counterpart (see Gp. 1, 2A12 - amps. max.	0.285±0.412	1.9	1.25	2.5	14		12	0.005	4.5	0.005	+2.5
VOLTAGE REGULATORS												
CK5783	Voltage reference tube (like 5651)	0.400	1.5	Operating voltage 87. Operating current range 2.5 to 3.5 ma.								
CK5787	Voltage regulator	0.400	2.56	Operating voltage 150. Operating current range 5 to 25 ma.								

CK 5 66 [illegible] [illegible] Voltage Gain Ratio

RAYTHEON

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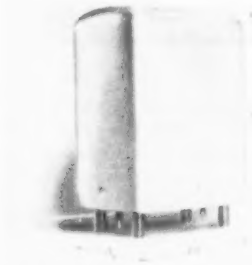
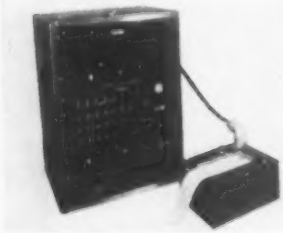
tions are in guided missiles, radar, electronic computers, and general-application laboratory instruments.



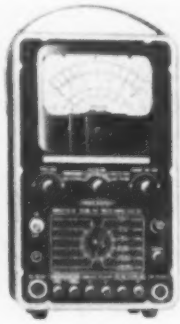
H-V Power Supply

ELTRON INC., 407 North Jackson St., Jackson, Mich. Model 103D-6 hermetically-sealed, miniature, high-voltage power supply was designed for use in military Geiger-counter equipment. It operates from a 3-volt battery and delivers a regulated and filtered output of 900 volts d-c. The unit employs a novel four-pole vibrator used in a self-rectifying voltage-multiplier circuit. Power outputs ranging from a few milliwatts to about three watts can be furnished efficiently at output voltages as high as 2,500 volts.



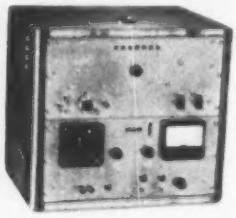
Recording Counter

POTTER INSTRUMENT CO., INC., 136-56 Roosevelt Ave., Flushing, N. Y., announces the highspeed Teledeltos paper recorder for use with counters and counter-chronographs. The count or time interval normally registered on the electronic counter indicator lamps is transferred to Teledeltos paper at the completion of each measurement and the counter is automatically reset for the next measurement. The recorder illustrated is connected to a 1.6-mc counter-chronograph and was designed for measurements of machine-gun projectile velocity. It will measure and record time intervals with an accuracy of 0.625 μsec at repetition rates up to 25 per second.



VTVM and Multirange Tester

PRECISION APPARATUS CO., INC., 92-27 Horace Harding Blvd., Elmhurst, N. Y. Series EV-20 portable vtvm and multirange test set is a complete vtvm-megohmmeter with true zero-center on all vtvm ranges, plus direct-reading h-f scales. It also provides full standard 100 ohms-per-volt functions. The unit affords 48 ranges to 1,200 volts, 2,000 megohms, 12 amperes, +63 db; and d-c vtvm ranges to 12,000 and 30,000 volts when used with the tv superhigh-voltage test probe.



All-Purpose Scaler

NUCLEAR INSTRUMENT & CHEMICAL CORP., 229 W. Erie St., Chicago, Ill. The Ultra-Scaler illustrated provides facilities for every type of counting by either automatic or manual methods within one instrument. It incorporates a built-in timer which may be set for a predetermined length of time and will then turn off the scaling unit automatically. The unit has two inputs, one for Geiger pulses and the other for very small proportional pulses requiring linear amplification. The Higinbotham-type scale of 128 has a resolution time of 2 μsec. Stabilized high voltage is available up to 2,500 v, and a built-in register indicates total number of counts.

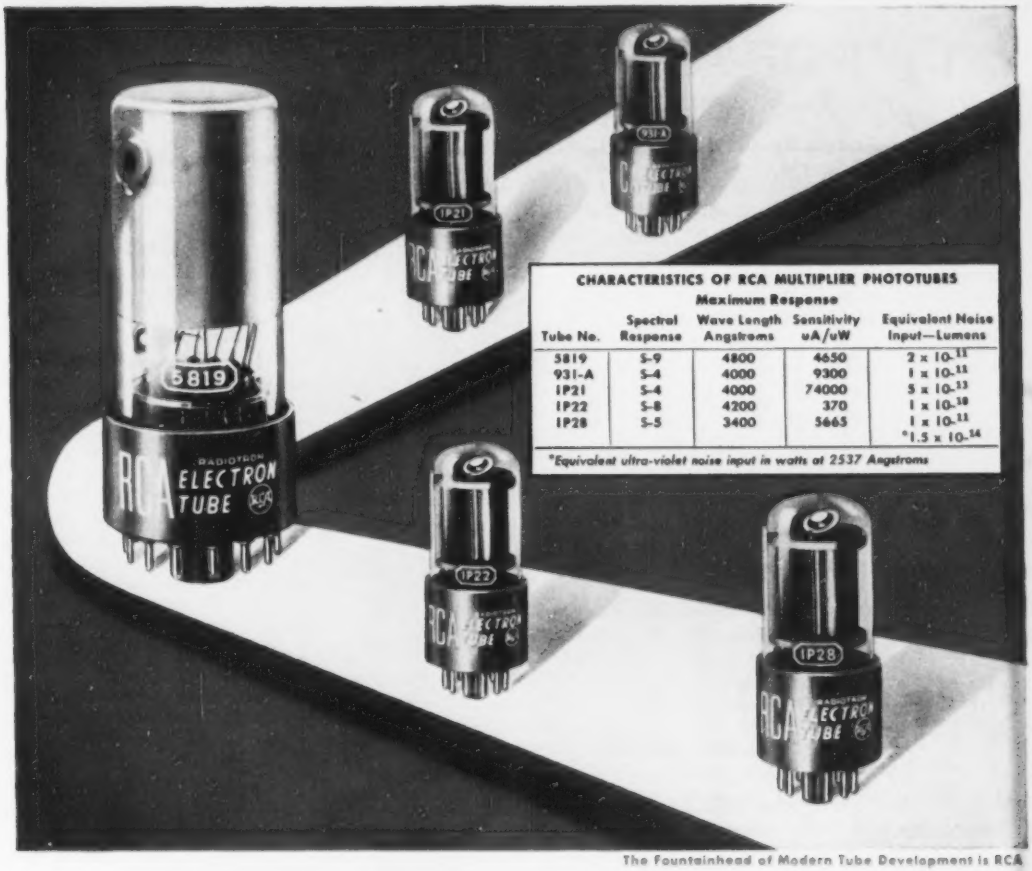
Tele Signal Generator

SYLVANIA ELECTRIC PRODUCTS, INC., 500 Fifth Ave., New York 18, N. Y., has announced the type 500 sweep signal generator for servicing f-m and television receivers. Its f-m sweep range is from 0 to 600 kc, and television sweep from 0 to 15 mc. Fundamental output frequencies are provided that range from 2 to 230 mc, in four bands. Output is at least 100 mv on all bands controlled by a smooth attenuator.

Test Transformer

RADIO CORP. OF AMERICA, Harrison, N. J. The WP-25A television Isotap, a combination autotransformer

(Continued on p 192)



CHARACTERISTICS OF RCA MULTIPLIER PHOTOTUBES

Tube No.	Spectral Response	Maximum Response Wave Length Angstroms	Maximum Response Sensitivity uA/uW	Equivalent Noise Input—Lumens
5819	S-9	4800	4650	2×10^{-11}
931-A	S-4	4000	9300	1×10^{-11}
1P21	S-4	4000	74000	5×10^{-13}
1P22	S-8	4200	370	1×10^{-10}
1P28	S-5	3400	5665	1×10^{-11}
				*1.5×10^{-14}

*Equivalent ultra-violet noise input in watts at 2537 Angstroms

The Fountainhead of Modern Tube Development is RCA

RCA Multiplier Phototubes...

for low-level detection and measurement

The extraordinarily high values of amplification obtainable from RCA Multiplier Phototubes make them particularly applicable to the detection and measurement of low levels of illumination. Coupled with suitable phosphors, these tubes may also be used for detecting and measuring nuclear particle radiation. The secondary-emission multiplier stages employed in these tubes make possible improved signal-to-noise ratio at very low illumination levels.

RCA-5819 with its head-on photocathode of large diameter may be used in scintillation counters for the detection and measurement of nuclear particle radiation, and in other applications involving low-level, large-area light sources.

RCA-931-A is the preferred type for high-volume, low-cost applications.

RCA-1P21 now has a sixfold improvement in noise input. It is especially desirable for photo-electric spectrometers, astronomical telescopes, and scintillation counters using collimated light beams.

RCA-1P22 is especially useful in colorimetry and spectroscopy requiring the advantages of a panchromatic surface.

RCA-1P28 is intended for specialized industrial and scientific applications such as spectrophotometry, where the measurement of low levels of ultraviolet radiation is involved. Its envelope of special glass permits transmission of ultraviolet radiation down to a wavelength of 2000 Angstroms.

RCA Application Engineers are ready to assist you in the adaptation of these or any other RCA tube types to commercial electronic equipment. For further information write RCA, Commercial Engineering, Section F42R, Harrison, N. J.

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RCA, LANCASTER, PA.

RADIO CORPORATION of AMERICA

ELECTRON TUBES — **HARRISON, N. J.**

NEWS OF THE INDUSTRY

Edited by WILLIAM P. O'BRIEN

Round-the-World Radio Signals in 55 Hops

VERY-LOW-FREQUENCY radio signals traveling completely around the world have now been detected by Jack N. Brown of the National Bureau of Standards. The signals, transmitted from the Naval Radio Station NSS at Annapolis, Maryland, on a frequency of 18 kc with a power of 350 kw, were received at the National Bureau of Standards radio propagation field station at Sterling, Virginia, about 50 miles away. Normal delay time for a round-the-world signal was more than a tenth of a second, and maximum signal intensity was observed at sunset.

The round-the-world signals were received, with the aid of a large loop antenna 150 feet high, on a tuned-radio-frequency receiver. A dual-beam oscilloscope was connected ahead of the detector stage in the receiver so that the actual unrectified r-f envelope was displayed on the 5-inch screen along with an 18-kc reference voltage. The delay time of the round-the-world signals was measured by making a moving film record of the oscilloscope screen.

The test signal transmitted from NSS consisted of a series of dots, each dot followed by a quiet period equal in duration to five dots. The test tape was transmitted at normal sending speeds, so that the pulse length of each dot was about 40 milliseconds with a repetition rate of four pulses a second.

During the winter months when these tests were conducted, the delayed signal was visible throughout the entire day. Observations of field intensity over several 24-hour periods disclosed the striking sunset maximum. A sharp peak in signal strength at 4:30 p.m. corresponded to optical sunset at the place of transmission and reception. It is an observed fact that low-frequency signals are severely attenuated when their path crosses a sunset zone. Any round-the-world signal must cross a sunset zone except during that portion of the day when the sunset zone is at the transmitter-receiver location. This explains the relatively greater strength of the signals at sunset in the transmitter-receiver location.

Delay times were measured on two different occasions under widely differing ionosphere conditions. Measurements were made first during a severe ionosphere storm, and a second set of measurements were made on a normal day. The average delay time during the storm was 0.1365 ± 0.0005 second, but on a normal day the average was 0.1373 ± 0.0005 second. The shorter delay time during a storm may be explained by the slightly lower effective height of the reflecting layer of the ionosphere under the influence of corpuscular bombardment from the sun. In any case the average values indicate a shorter propagation path for l-f signals during an ionosphere storm.

The transmission of radio waves over long distances may be thought of either as the propagation of a guided wave between the concentric spherical surfaces formed by the earth and the ionosphere, or as successive multiple reflections from the earth and the ionosphere. Within the limits of a ray approximation, both pictures yield the same results. For the delay time on a normal day (0.1373 sec) the number of hops corresponding to an ionosphere height of 65 kilometers is 55 for one trip around the earth. The length of each hop is thus 728 kilometers and the angle of takeoff is 8 degrees.

ADVANCED COMPUTER TECHNIQUES

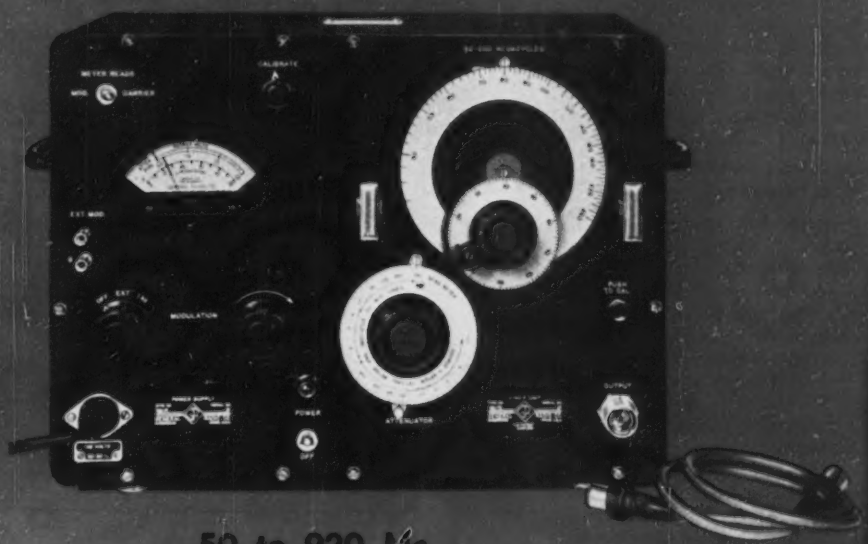
A means for endowing modern computers with a whole new faculty, the ability not only to detect their own mistakes but actually to correct them, has been developed at Bell Telephone Laboratories. The basic concepts underlying the new technique are the direct result of pure mathematical research carried out by Dr. R. W. Hamming (left), Bell Laboratories mathematician. Apparatus incorporating the mathematical discovery has been constructed under the direction of B. D. Holbrook (right), Bell Laboratories switching research engineer

Carrier-Current Measurements Meeting

A MEETING is scheduled to be held June 6, 1950 in the offices of the Federal Communications Commission for the purpose of establishing a joint industry-government committee to obtain field intensity measurements of line radiating devices and systems. Six working groups are now engaged in procuring field data.

All interested persons are invited

Announcing A New GR Standard Signal Generator



50 to 920 Mc

THE new General Radio Type 1021-A Standard-Signal Generator operates at frequencies between 50 and 920 Mc with the same convenience and reliability found in other G-R generators in the broadcast frequencies.

Its main use is the determination of radio receiver and circuit characteristics. With an inexpensive diode modulator, television picture modulation can be produced for overall testing of television receivers.

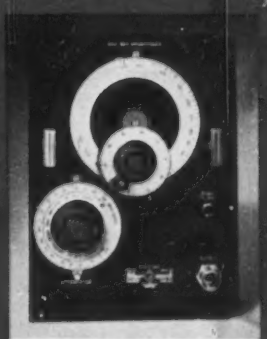
It is a convenient and well-shielded source of power for measurements with bridges, impedance comparators, and slotted lines. For these uses internal modulation is provided.

With the new G-R Type 874 line of Coaxial Elements, this generator provides a very complete and flexible system for measurements of voltage, power and standing-wave ratio from 50 to 920 Mc.

FEATURES

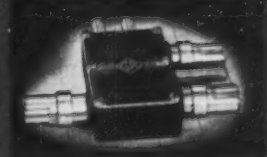
- **SIMPLICITY, RELIABILITY, CONVENIENCE** of a standard broadcast generator. **ACCURATE · COMPACT · LIGHTWEIGHT**
- **MODERATELY PRICED**
- **BUTTERFLY TUNING CIRCUIT** . . . no sliding contacts . . . no noise . . . perfectly smooth tuning . . . rugged design with good stability and very low drift
- **REGULATED POWER SUPPLY** assures good heterodyne beat note
- **OUTPUT FROM 0.5 MICROVOLT TO ONE VOLT** with overall accuracy better than ±20%
- **INTERNAL OUTPUT IMPEDANCE** 50 ohms
- **LEAKAGE AND RESIDUAL OUTPUT VOLTAGE** below sensitivity of most receivers
- **INTERNAL 1000-CYCLE AND EXTERNAL AMPLITUDE MODULATION** over audio range, adjustable from 0 to 50% . . . incidental fm under 100 parts per million over most of the ranges
- **T-V PICTURE MODULATION ON ALL CHANNELS** from 50 to 920 Mc with NO INCIDENTAL FM, when Type 1000-P6 Crystal-Diode Modulator and source of video signals are used. The power requirements for modulation are so low, video output from a standard T-V receiver can be used

TYPE 1021-AV V-H-F Standard-Signal Generator (50-250 Mc)	$595.00
TYPE 1021-AU U-H-F Standard-Signal Generator (250-920 Mc)	615.00
TYPE 1000-P6 Crystal-Diode Modulator	35.00



Type 1021-P2 Oscillator Unit (250-920 Mc)
Two separate oscillators are available. They are mechanically and electrically interchangeable, and are sold as separate units to convert the range of one standard-signal generator to that of the other.

TYPE 1021-P2 U-H-F Oscillator Unit only (250-920 Mc)	$420.00
TYPE 1021-P3 V-H-F Oscillator Unit only (50-250 Mc)	$400.00



Type 1000-P6 Crystal Diode Modulator
An inexpensive, wide-band modulator for amplitude modulation of carrier frequencies between 20 and 1000 Mc. Modulation-frequency range is 0 to 5 Mc.
$35.00

GENERAL RADIO COMPANY Cambridge 39, Massachusetts

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to attend. It is desirable that all participating persons come prepared to present and discuss such data as they may have available. The Commission suggests that all data and reports be furnished with copies for distribution to other persons present. All information received will be carefully considered and future plans projected.

Nonferromagnetic Synchrotron

SUCCESSFUL operation in its first phase of a new type of atom smasher, which is ultimately expected to produce X-rays of 300,000,000 volts, was announced recently by Dr. C. G. Suits, vice-president and director of research for General Electric Co. Schenectady, N. Y.

The new machine, known as a nonferromagnetic synchrotron, is being built under the joint sponsorship of the Office of Naval Research and the GE Research Laboratory. It has been operated thus far up to about a million volts and probably it will be in operation at much higher energies before the end of the year. It will be used to study the effects of high-energy radiation, particularly in nuclear research.

The new particle accelerator is of a design that eliminates the huge iron-core electromagnet commonly used in such devices. The requisite powerful magnetic fields are produced solely by specially designed coils of wire. These carry heavy currents, and are contained in a steel tank from which air has been exhausted.

First erected in one of the old buildings of the GE Research Laboratory in downtown Schenectady, the new synchrotron is now being installed in its own building at the Laboratory's new quarters at the Knolls, in nearby Niskayuna.

The first operating synchrotron in the United States was completed in 1946 in the GE Research Laboratory. This 80,000,000-volt machine also was sponsored by the Office of Naval Research. In this synchrotron there is a doughnut-shaped vacuum tube, placed between the poles of an 8-ton electromagnet. Inside the tube is an electron gun. The electrons fired from it, guided by the magnetic field and accelerated by the increasing magnetic induction, reach energies of several million volts. Their speed is then practically that of light. Up to this point the operation is similar to that of another type of accelerator, the betatron.

In the nonferromagnetic synchrotron there is a cylindrical steel tank

(Continued on page 232)

MEETINGS

JUNE 1–2: Fourth National Convention and Fifth Midwest Conference of the American Society for Quality Control, Milwaukee Auditorium, Milwaukee, Wisc.

JUNE 12–16: AIEE Summer and Pacific General Meeting, Huntington Hotel, Pasadena, Calif.

JUNE 19–20: 1950 annual convention of the American Society for Engineering Education, University of Washington, Seattle, Wash.

JUNE 26–30: Annual Meeting and 9th Exhibit of Testing Apparatus and Related Equipment, Hotel Chalfonte-Haddon Hall, Atlantic City, N. J.

JUNE 26–JULY 22: Summer Electronics Symposium, University of Michigan, Ann Arbor, Mich.

AUG. 27–31: NEDA National Convention and Exhibition, Cleveland Public Auditorium, Cleveland, Ohio.

AUG. 28–31: APCO National Conference, Hotel Hollenden, Cleveland, Ohio.

SEPT. 11–23: URSI Ninth General Assembly, Zurich, Switzerland.

SEPT. 13–15: 1950 IRE West Coast Convention and Sixth Annual Pacific Electronic Exhibit, Municipal Auditorium, Long Beach, Calif.

SEPT. 18–22: Fifth National Instrument Conference and Exhibit, Memorial Auditorium, Buffalo, N. Y.

SEPT. 25–27: National Electronics Conference, Edgewater Beach Hotel, Chicago, Ill.

OCT. 3–5: AIEE District No. 2 Meeting, Lord Baltimore Hotel, Baltimore, Md.

PACIFIC ELECTRONIC EXHIBIT PLANNED

Discussing plans for the 6th annual Pacific Electronic Exhibit to be held in the Municipal Auditorium, Long Beach, Calif., Sept. 13, 14 and 15, 1950, are, left to right: L. W. Howard, general show committee chairman of WCEMA, which sponsors the exhibit; R. L. Sink, chairman of the Los Angeles Section of IRE and L. C. Sigmon, IRE liaison chairman for the exhibit

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NEW BOOKS

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Theory and Design of Electron Beams....134
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Industrial Electronics....136
The Characteristics of Electrical Discharges in Magnetic Fields....140
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Electron Tube Circuits

BY SAMUEL SEELY. *McGraw-Hill Book Co., New York*, 1950, 528 *pages*, $6.00.

A BOOK to cover the field of electron-tube circuits could easily fill a five-foot shelf all by itself. Professor Seely, therefore, has shown admirable restraint in producing a volume that is not only good looking from the standpoint of modern book design and format but which is of very reasonable size. He has done this by dividing the subject into certain broad divisions, by presenting a coordinated account of each division, by giving an analysis of characteristic examples of the use of tubes and circuits in these divisions, and by avoiding unnecessary details in describing any particular example or by giving too many examples.

The aim is to equip a student with the analytical power to study tube circuits. With such power the problems of design become simple.

About half of the book deals with circuits useful to radio engineers; the rest of the material covers radar, television, pulse communication and electronic control. Since it is not a radio book, there is nothing about radiation or about systems in it. There are 22 chapters and they cover amplifiers, oscillators, rectifiers, modulation and demodulation, relaxation circuits, sweep generators and electronic instruments.

The analytical techniques employed will be the chief interest for an engineer already trained; for the student the book will provide a high-level course; and if either understands the text sufficiently to work the problems correctly, he will be well on his way toward being a most competent electronics engineer.—K. H.

Theory and Design of Electron Beams

BY J. R. PIERCE, *Bell Telephone Laboratories, Inc. D. Van Nostrand Company, Inc., New York*, 1949, 197 *pages*, $3.50.

WELL-KNOWN J. R. Pierce has brought out a new book intended for those students and scientists interested in the behavior of electron beams. Written on the graduate level, it discusses that material on

(continued on page 135)

BACKTALK

This Department is Operated as an Open Forum Where Readers May Discuss Problems of the Electronics Industry or Comment Upon Articles Which ELECTRONICS Has Published

Video on Tape

DEAR SIRS:

YOUR EDITORIAL comment regarding Howard Chinn's ideas on recording television signals on magnetic tape started me to figuring out sizes and such.

I find that with the present state of the art the tape would have to be driven at 500 inches per second which is 41⅔ feet. In order to record a fifteen-minute program 37,500 feet of tape would be required, which could be wound on a spool having an outside diameter of 38 inches and a hub diameter of 10 inches. These figures preserve the same ratios as found in the popular seven-inch plastic spool. This spool would be required to revolve at approximately 950 revolutions per minute when nearly empty of tape. At this speed the rim would be making a speed of nearly two miles per minute.

At 500 inches per second the top frequency which could be reproduced would be about 500 kilocycles. The low end could be carried down to about 500 cycles without excessive equalization in the playback amplifier. For a 500-cycle low end the equalization required would be approximately 45 decibels. In order to carry the response down to 20 cycles the equalization required would be about 70 decibels.

Basing the design on a quarter-inch effective track width a piece of tape two inches wide would be required for a four-megacycle bandwidth. This all assumes that the problems of signal-to-noise ratio and differential phase shift could be overcome.

Not the least in importance is the cost of a fifteen-minute recording. Basing the computation on a 1,200-foot spool of 0.250-in.-wide tape costing $5.50, the 37,500 feet of two-inch material would come to $1,375.

I think it must be obvious that this approach is impractical, but I am sure the job will be done before too long.

JOHN S. BOYERS
Chief Engineer
Magnecord, Inc.
Chicago, Ill.

Let's Settle It

DEAR SIRS:

FOR A NUMBER of years you and I and numerous others have been busily engaged in this thing tacitly called electronics, earning our living thereby and creating a myriad of useful and maybe not-so-useful de-

(continued on page 242)

electron beams which lends itself most readily to mathematical analysis, although some attention is also given to experimental techniques. This book fills a definite need because most previous books on electron optics are intended for people whose primary interest is electron microscopes and image tubes and, therefore, include extensive treatments of such topics as aberrations.

Dr. Pierce's book is clearly intended for those concerned with the formation and focusing of electron beams for use in such devices as low-frequency amplifiers, oscillators, and, especially, microwave tubes.

The first part of the book deals with the basic concepts of the properties of electric and magnetic fields, the forces and equations of electron motion, and examples of simple electron motions. These concepts lead to some general relations such as Busch's and Liouville's theorems, trapping of electrons in symmetrical electric and magnetic fields, and index of refraction in electric fields. Special techniques (solution by inspection, rubber model, and tracing of paths) are treated.

The author develops the important paraxial-ray equation and its solution for electric and magnetic lenses. The properties of electric and magnetic lenses are fully discussed and both analytical and numerical solutions are presented for various important basic examples. Final chapters are devoted to the discussion of the Effect of Thermal Velocities, Space Charge in Electron Beams, and Electron Guns Utilizing Rectilinear Flow. The reader will also find information on such interesting topics as, for instance, "How Nearly Can The Limiting Current Density be Approached", effect of ions on limiting current density, and cathode-ray tube after-acceleration as affected by thermal velocities.

The book contains numerous illustrations and the reader is often given the benefit of the author's experience because comparisons between theory and practice are frequent. All chapters are followed by excellent problems which are so chosen as to bring out certain points and are typical of the prob-

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For the student who is grooming himself for activity in the electronic field. This book covers the subject of frequency modulation thoroughly in a down-to-earth treatment of all types of FM systems employed in television, radio, amateur radio, railroad, aviation, marine, police, point-to-point and mobile receivers. Basic theory, transmission, reception, circuit design and servicing are covered, with mathematics kept to an absolute minimum. Almost all presently used commercial FM transmitters are described in detail. Question section follows each chapter.

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ENCYCLOPEDIA ON CATHODE-RAY OSCILLOSCOPES AND THEIR USES

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The greatest and most complete reference book ever written on the cathode-ray tube! It is a practical, down-to-earth encyclopedia about five times the size of the old standard text. Starting with basic theory of cathode-ray tube operation, it proceeds through application in scopes and TV receivers . . . with full and clear explanations for uses in every field and research activity which employs a cathode-ray oscillograph. All scopes produced and sold during the last 10 years, more than 70 different models are described completely—with schematic wiring diagrams. Almost 500,000 words and about 3,000 illustrations are incorporated in more than 900 pages. It is a book which will enjoy years and years of daily use. 22 chapters.

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TELEVISION INSTALLATION TECHNIQUES

by Samuel L. Marshall

This book, written by Mr. Marshall, television instructor at the George Westinghouse Vocational High School, is a practical, easy-to-understand treatment of information pertaining to the antennas, transmission lines, receiver adjustments, and above all, the mechanical requirements, whether they be for short mast for chimney attachment or for the installation of a tower, including foundation. Both theoretical and practical aspects of every phase of this activity, from the topmost element of the antenna to the ground connection on the receiver terminal board, are fully discussed.

VACUUM-TUBE VOLTMETERS

by John F. Rider

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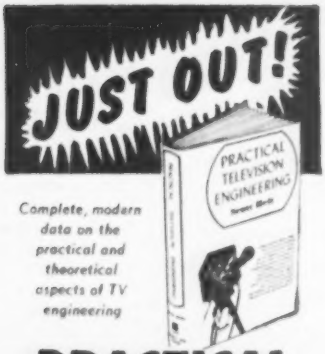

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lems encountered in the design and application of cathode-ray tubes, magnetrons, electron multipliers and similar devices. There are also frequent footnotes giving references for those wishing more information on specific subjects. The mks system of units is used.

It is to Dr. Pierce's credit that he has written a clear book on an especially difficult subject. The reader will do well, however, to have some background in electron ballistics. The book seems to suffer in organization to some extent, in that the content, although systematically arranged, is not continuous and is often a series of discussions of specific topics. Nevertheless, the book gives promise of becoming a bible in its field, both in the classroom and in the laboratory.—FRANK R. ARAMS, *Tube Dept., Radio Corp. of America, Lancaster, Penna.*

Television Antennas

BY DONALD A. NELSON. *Howard W. Sams & Co., Inc., Indianapolis, Indiana*, 1949, 166 *pages, paper-covered*, $1.25.

WAYS and means of converting a transmitted television signal to microvolts at the receiver input, to guide service technicians in selection and installation of suitable antennas and accessories for each location. The six chapters cover: Receiving Antenna Principles; Antenna Construction; Commercial Antennas; Antenna Installation; Common Installation Problems. Clearly written and liberally illustrated, it forms an excellent and inexpensive guide for the electronic engineer who chooses to install and adjust his own television antenna. —J.M.

Industrial Electronics

BY ANDREW W. KRAMER. *Pitman Publishing Company, New York*, 1949, 311 *pages*, $6.00.

This book is intended for readers who have "a good knowledge of general physics and engineering but who have had very little training or experience in electronics." To a very great extent, this purpose has been achieved, and a reader who has the time and initiative to sit

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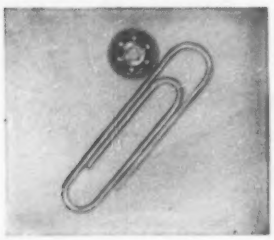

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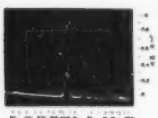

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Send for Bulletin No. 12

BALLANTINE LABORATORIES, INC.

BOONTON, NEW JERSEY, U. S. A.

down and assimilate the contents of this book can emerge enlightened in the field of electron tubes of all important types, and their application to industrial measurement, production and control problems.

As pointed out by the author in his preface, the basic material for much of this book appeared first in a series of articles on electron tubes published in *Power Plant Engineering* (of which the author is editor), from 1936 to 1939. As such, it is not recognizable, for many improvements and additions have been made.

The book begins logically with a general picture of the history and basic requirements of electronics in industry. Approximately the first 185 pages deal in generalities of tube characteristics and electron behavior, and the remaining sections cover specific applications.

One particularly obvious disadvantage to the application portion of the book is the absence of values for circuit components and of detailed calibration and installation information. However, wherever possible, the author has referred to the literature where additional information of such nature may be obtained.

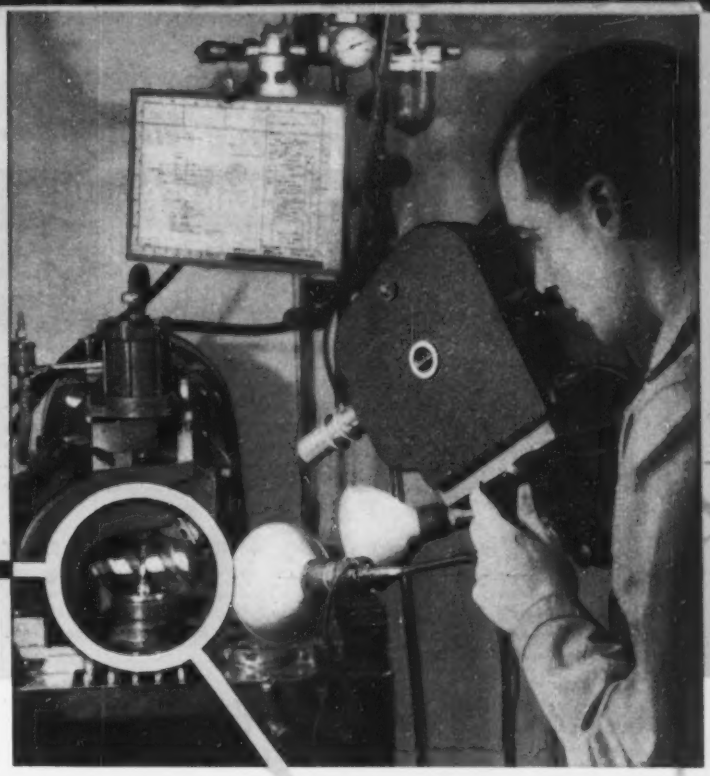
It is questionable that this book would be of much value as a reference book. Its components are arranged in a logical teaching order, but for circuit references and engineering-level information, it falls slightly short of the mark. It should be, however, a welcome addition to the student's reading list while he is engaged in a course in electronics.—J.D.F.

The Characteristics of Electrical Discharges in Magnetic Fields

National Nuclear Energy Series, Division 1, Volume 5, EDITED BY A. GUTHRIE AND R. K. WAKERLING. *McGraw-Hill Book Co., New York*, 1949, 376 *pages*, $3.50.

THIS BOOK presents mainly the experimental results and supporting theory on the characteristics of the arc discharge produced by an electron beam, the arc being subjected to a strong magnetic field and confined in a rather specialized volume;

The shortest distance between guessing and knowing



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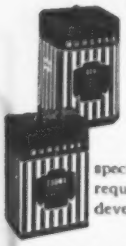

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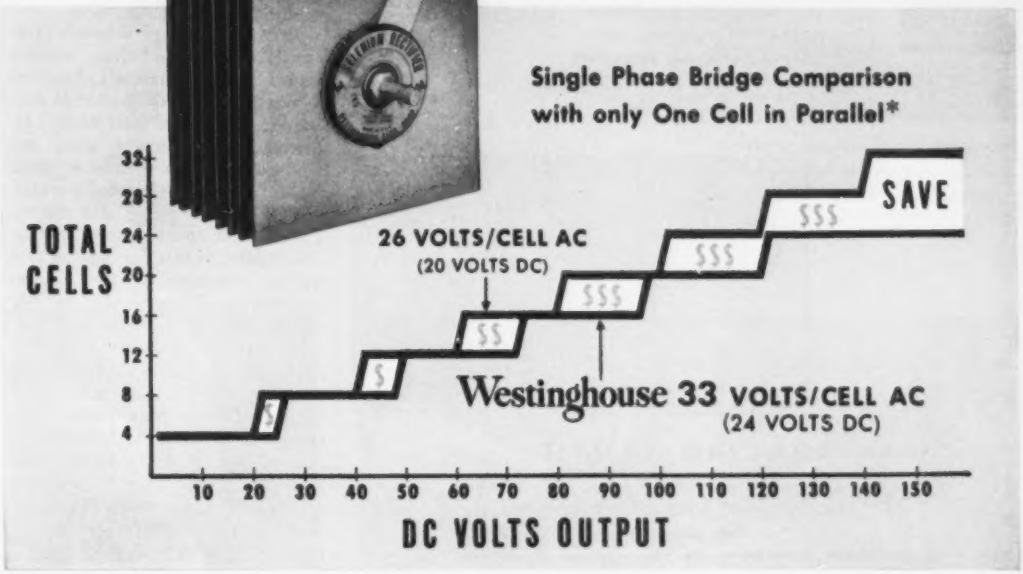

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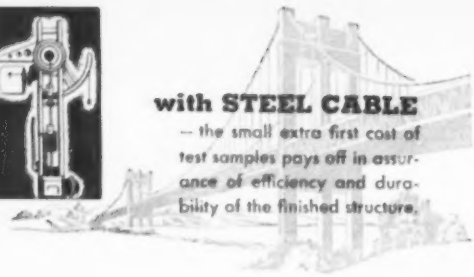

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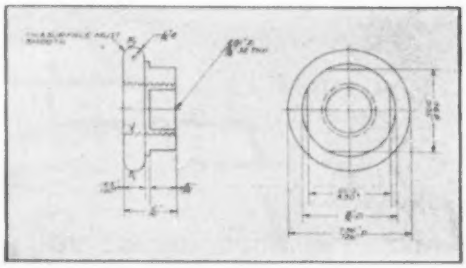

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the principal parameters studied and displayed are type of gas, gas pressure, ion currents, arc currents and voltages and their space distributions, and the magnetic field intensity.

The contents are derived principally from technical reports issued by the Radiation Laboratory of the University of California during the progress of their work. Although these reports were not written with this volume in mind, skillful editing has created a creditable degree of unity and clarity. Three of the chapters were written specifically for this volume, the first aiding considerably the general orientation of the reader to this rather specialized subject.

Workers concerned with the problems of ion production by these means will find a great amount of valuable detailed information, even though the scope of the information is considerably less than the title suggests. This book suggests a number of problems for further investigation, and is therefore of interest to research workers looking for new problems. One of these problems of fundamental interest, to which reference is made throughout the book, is that of high-frequency oscillation of the plasma. The immediate aims of war-time development apparently excluded a study of this phenomenon at that time.

The several introductions to the book merit particular attention because they explain the aims of the National Nuclear Energy Series and the constraints applicable to the publication of such a great volume of material. These explanations allay to a great extent any criticism which might arise from judging this book by all of the conventional standards of technical publications.—WALTER E. TOLLES, *Airborne Instruments Laboratory, Mineola, New York.*

Radar Systems and Components

BY BELL TELEPHONE LABORATORIES STAFF MEMBERS. *D. Van Nostrand Co., New York,* 1949, 1,042 *pages,* $7.50.

COMPILATION of fifteen papers originally published in the Bell System Technical Journal, arranged in

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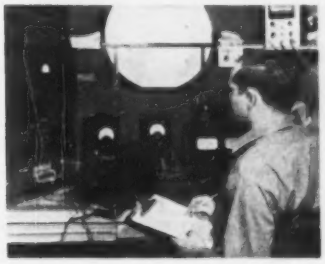

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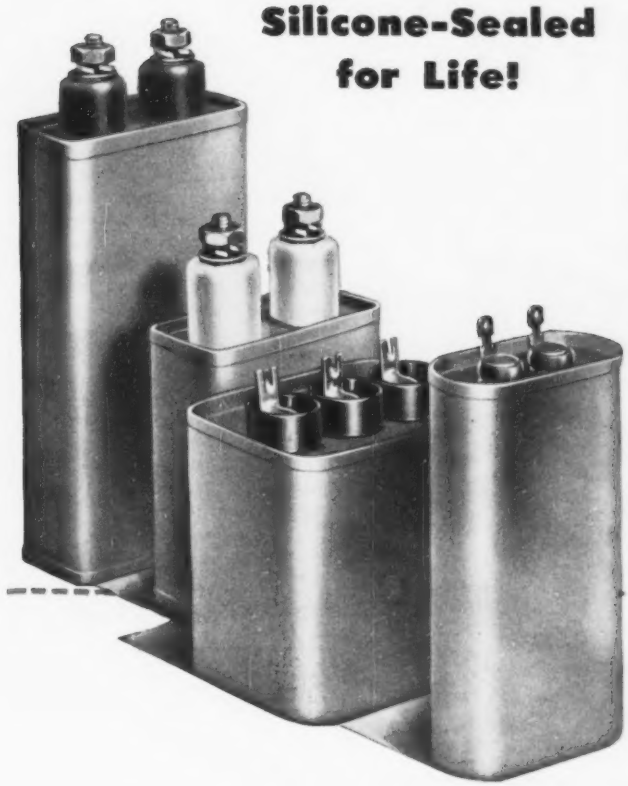

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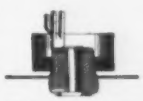

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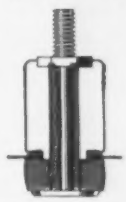

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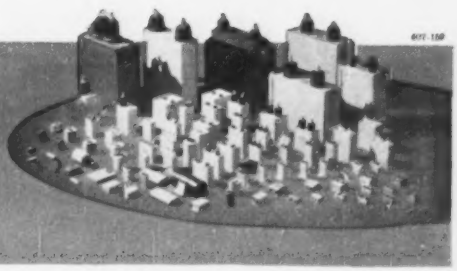

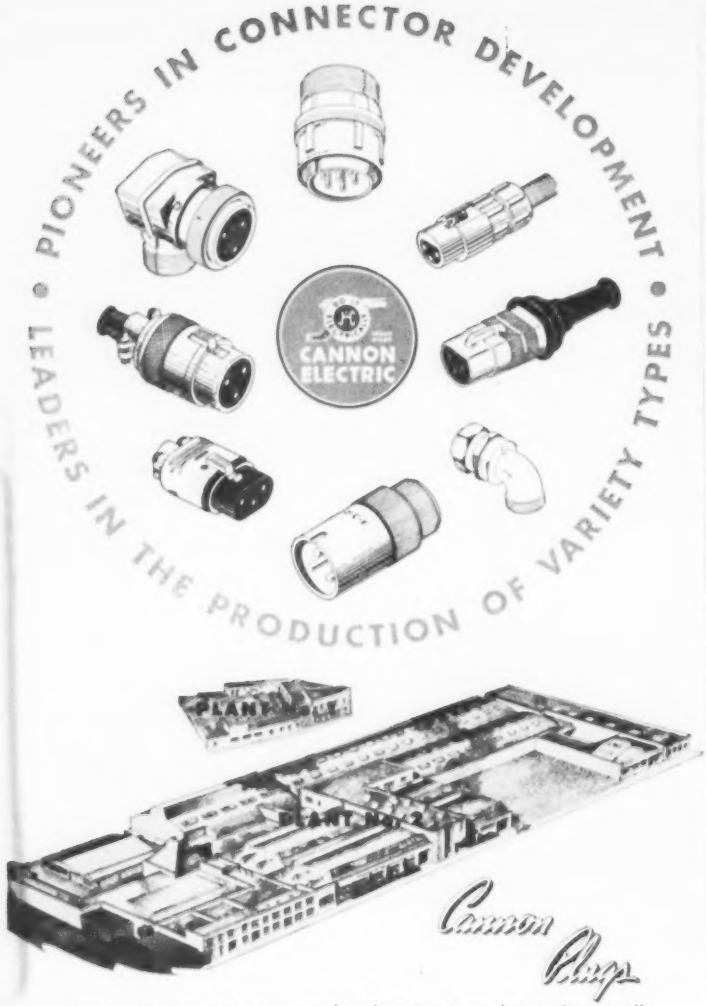
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Main offices and factory, Cannon Electric Development Company, Division of Cannon Manufacturing Corporation, 3209 Humboldt Street, Los Angeles 31, California. Canadian offices and factory, Cannon Electric Co. Ltd., Toronto. Export: Frazar & Hansen, San Francisco, Los Angeles and New York.

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logical order. A comprehensive 22-page cross-index adds greatly to the reference value by speeding location of desired data. Though the individual articles were originally directed toward radar development, they today have broad application also in the field of microwave transmission and reception.

The opening 55-page paper, Early Fire-Control Radars For Naval Vessels, covers the first 500–700-mc radar, the CXAS radar and the Mark 1, 2, 3 and 4 radars. The next five papers deal with components, covering magnetrons, pulse modulator tubes, coil pulsers, spark gap switches and TR boxes. Two papers on circuitry follow, covering radar receivers and reflex oscillators. One paper deals with silicon crystal rectifiers, one with tubes for radar i-f amplifiers and one with radar antennas. Next comes a paper on microwave radar testing, followed by three final papers on various aspects of cavities.

All in all, the volume is a real contribution to the reference literature on radar and at the same time a good buy. Even for those who have a file of BSTJ the book is well worth getting, for the time saved in finding a desired topic.—J.M.

• • •

Books Received for Review

TELEVISION SIMPLIFIED. By Milton S. Kiver. D. Van Nostrand Co. Inc., New York, 1950, third edition, $6.50. Chief additions in this edition are a chapter on intercarrier sound systems and new material on color television.

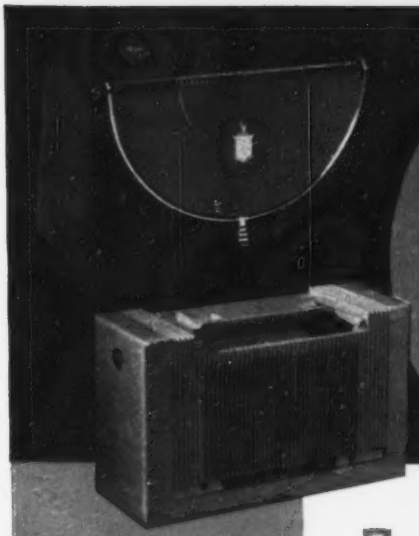
RADIO OPERATOR'S LICENSE Q & A MANUAL. By Milton Kaufman. John F. Rider Publisher, Inc., New York, 1949, 608 pages, $6.00. Covers FCC questions on f-m, radio communication, television, frequency-shift keying, marine radar and loran.

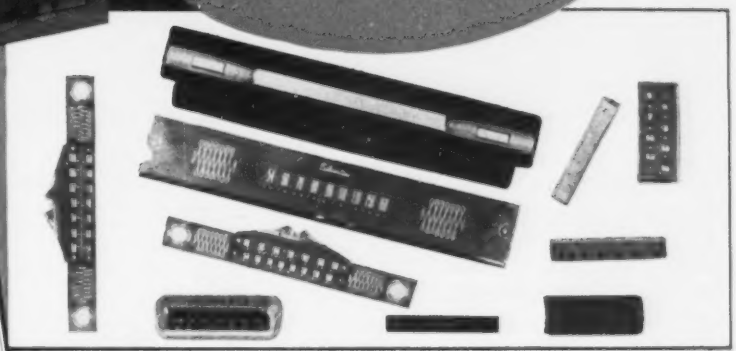
ELECTRICAL MACHINERY. By Fred A. Annett. McGraw-Hill Book Co., New York, 1949, Third Edition, 458 pages, $3.75. Four entire chapters of new material on electron tubes and circuits: Electrons and Electron Tubes; Electronic Rectifiers; D-C Motor Speed Control; Flame-Failure Protection and Smoke-Density Indicators.

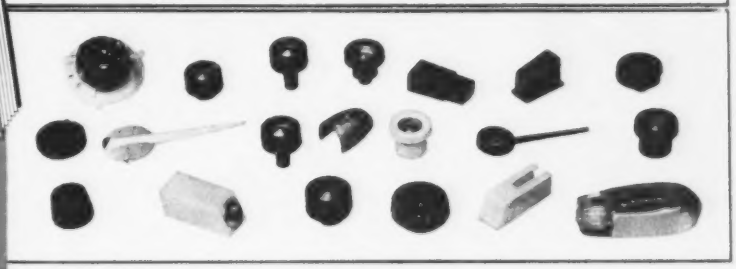
THE PROTECTION OF TRANSMISSION SYSTEMS AGAINST LIGHTNING. By Walter W. Lewis. McGraw-Hill Book Co., New York, 1949, 418 pages, $8.00. Though dealing specifically with power lines, many of the basic chapters are applicable to lightning problems of radio and television transmitting and receiving antennas.

PRACTICAL TELEVISION SERVICING & TROUBLE SHOOTING MANUAL. Coyne Electrical & Radio-Television School, Chicago, 1949, 400 pages, $4.25. Final chapter deals with color television and ultra-high frequencies. For servicemen, students and engineers who like to fix their own tv sets.

Custom Molded PLASTICS for the RADIO AND TV INDUSTRY by Erie Resistor

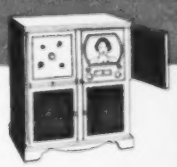






Write for your copy of our booklet, "Who We Are—What We Do."

One of a series of advertisements showing Erie Resistor Custom Molded Plastics used in various industries.



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TUBES AT WORK

(continued from page 120)

ceiver in much the same manner as three single-color picture tubes except that no optical superposing or registration means need be provided and deflection power need be provided for only one deflection yoke.

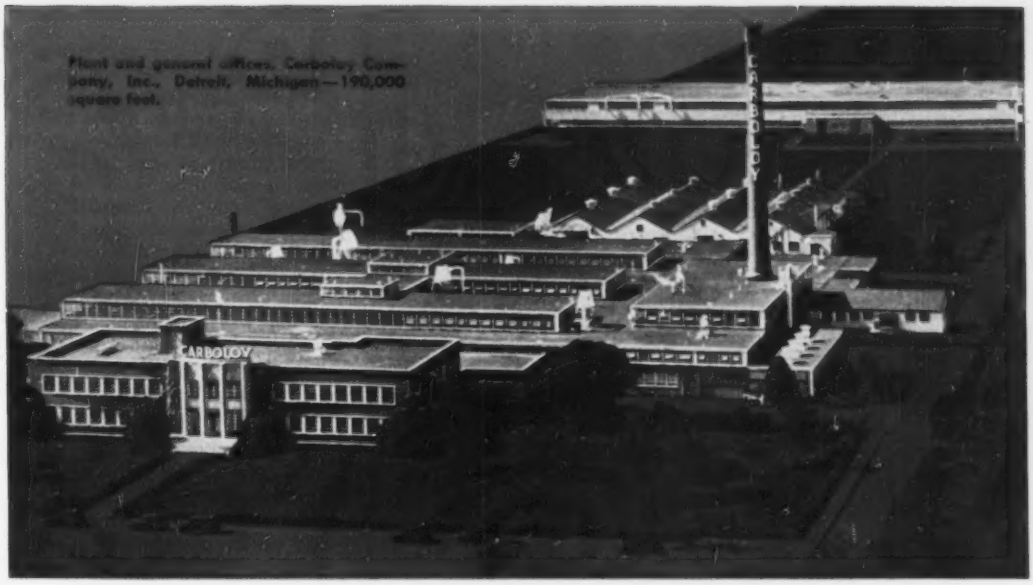
One experimental receiver demonstrated employed the three-gun tube and high-level sampling of the video signal. This receiver contains 46 tubes and consists essentially of a 27-tube black-and-white television receiver to which have been added 19 tubes for color synchronization, sampling and additional power supplies.

Single-Gun Tube

Operation of the single-gun kinescope is analogous to the operation of the three-gun tube in that the beam from the single gun is magnetically rotated so that, in effect, it occupies, in time sequence, the three positions of the three guns in the three-gun kinescope. When the beam is in a position corresponding to the green gun of the three-gun kinescope it excites only the green phosphor dots and is at this particular time modulated only by the green component of the video signal. A short time later the beam has been rotated to a position corresponding to the red gun of the three-gun kinescope and is modulated by the red component of the video signal to excite red phosphor dots. A third position similarly produces the blue picture. Sampling is automatically provided by rotating the beam synchronously at sampling frequency.

The experimental receiver employing the single-gun tube utilizes 37 tubes and consists essentially of a 27-tube black-and-white television receiver to which have been added 10 tubes for color synchronization, beam rotation and additional power supplies.

A block diagram of the principles of the circuit arrangement employed in the receiver utilizing the three-gun tri-color kinescope is shown. Video signal from a conventional black-and-white television receiver is applied simultaneously to the three internally-connected control grids of the three-gun kinescope. Another signal, derived



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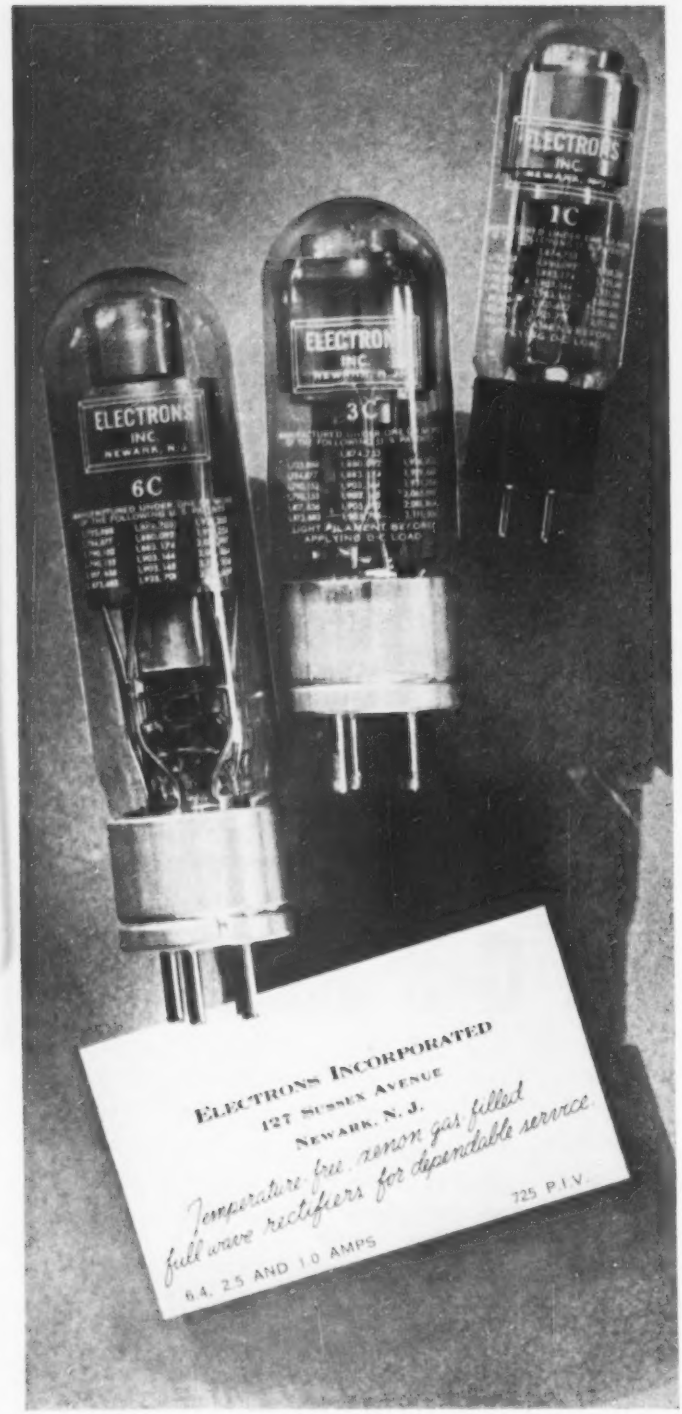

from the video amplifier, is used to actuate an automatic color phasing and sampling synchronization circuit which produces a local 3.58-mc sampling wave. The latter is applied through an amplifier tube and appropriate delay lines to three gating tubes which supply three sampling pulses, differing in phase by 120 degrees at 3.58-mc, to the three cathodes of the kinescope. Thus, each gun is turned on in time sequence corresponding to the original sampling process at the transmitter and the beam current from each gun excites only one of the three phosphor colors.

The tuning adjustment in the plate circuit of the 3.58-mc sampling-signal amplifier permits fine adjustment of the overall color phasing. However, proper color phasing is essentially determined by permanently installed delay lines which are cut to proper length.

The front-panel operating controls are the same for color as for black-and-white operation. Individual service adjustment controls are provided in the cathode circuits of the three guns to permit initial equalization of the control characteristics of the three guns.

The deflection circuitry is conventional but minor changes in deflection-tube types have been made to supply additional deflection power occasioned by the increased kinescope second-anode potential of 18 kv. The deflection yoke is of the anastigmatic type and has an internal diameter of two inches to accommodate the converging beams.

Convergence

Registration in the three-gun tube is accomplished by the proper registration of the masking apertures with their corresponding groups of phosphor dots. Means are also provided to converge the three beams to the same point on the phosphor screen during scanning. This is done for the undeflected beams by a convergence electrode, operated at 9,000 volts, and, when necessary, by small correcting magnets set up initially as a permanent service adjustment when the tube is installed. Because of the essentially flat face of the phosphor screen, simple geometrical considerations show that slightly

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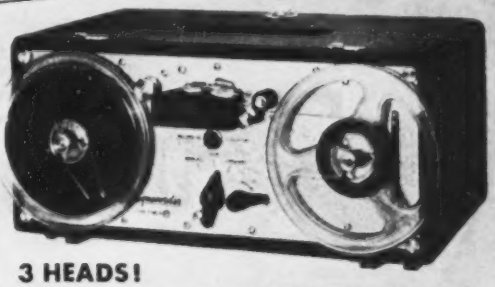

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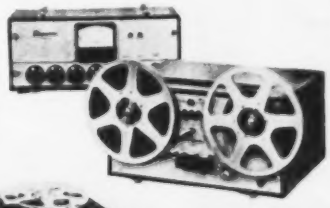

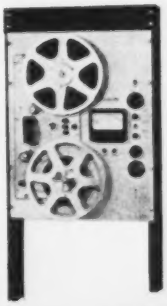

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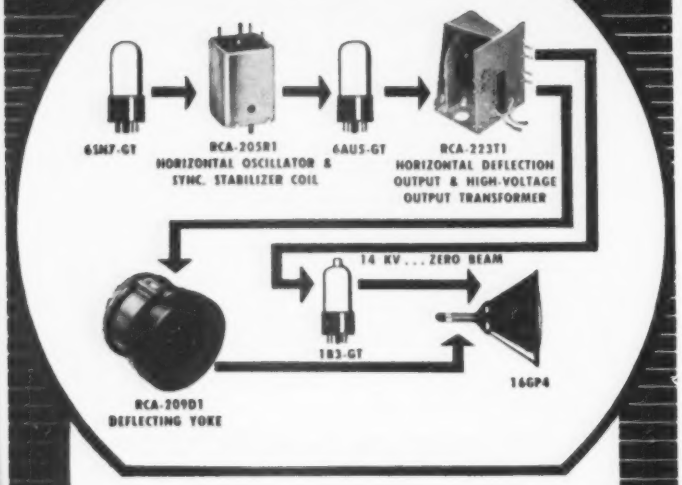

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less convergence is desirable as the beam is deflected from center. This dynamic convergence is accomplished by deriving a voltage from vertical and horizontal deflection circuits of the receiver and applying it to the convergence electrode through a capacitor.

An r-f type anode voltage supply provides a potential of 18 kv for the kinescope final anode, 9 kv for the electrostatic converging electrode and approximately 3.5 kv for the parallel-connected first anodes which produce initial electronbeam focus.

Single-Gun Receiver

A block diagram of the principles of the circuit arrangement employed in the receiver utilizing the single-gun picture tube is also shown. Video signal from the output of the video amplifier of a conventional black-and-white television receiver is applied to the control grid of the single-gun kinescope in the conventional manner. As in the previous receiver, another signal from the video amplifier actuates an automatic color phasing and sampling synchronization circuit which produces a local 3.58-mc signal which is locked in step with the transmitter sampler.

Circular deflection of the beam, which produces sampling automatically, is provided by a small deflection yoke having two sets of coil which are fed with quadrature currents at sampling frequency to produce a rotating field. Service adjustment of color phasing is provided by mechanical positioning of this yoke. The amplitude of the circular deflection is adjusted to produce the proper convergence angle as required by the mask and phosphor-dot screen.

The duration of the sampling period is controlled by a signal having a frequency three times the sampling frequency which is injected into the kinescope cathode circuit. The amplitude and phase of this 10.74-mc signal are determined by the alignment of a filter circuit which utilizes the third harmonic of the circular-deflection driver tube.

As in the receiver for the three-gun tube, the front panel controls of the single-gun set are the same

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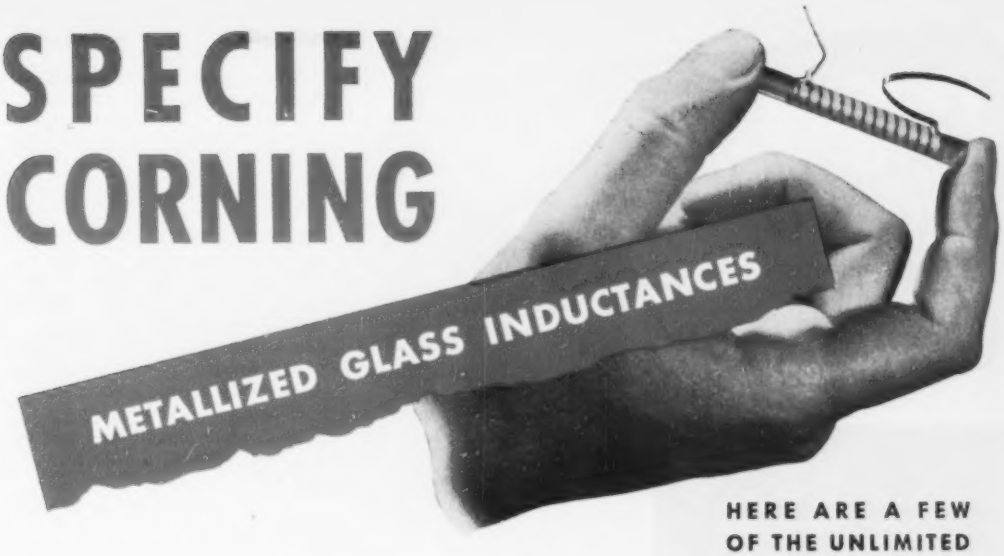

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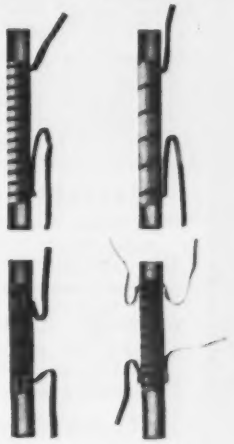

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as those used in a conventional black-and-white receiver. Because a single gun is used in this kinescope, color balance may be achieved by proper deposition of the phosphor dots. The deflection circuitry and deflection yoke are the same as those employed in the three-gun receiver.

The electron gun which is emp'oyed is the same as that used in the projection type 5TP4. Potentials of 18 kv for the final anode and 2.7 kv for the electrostatic focus electrode are derived from the kick-back voltage on the horizontal-deflection output transformer just as in conventional black-and-white receivers.

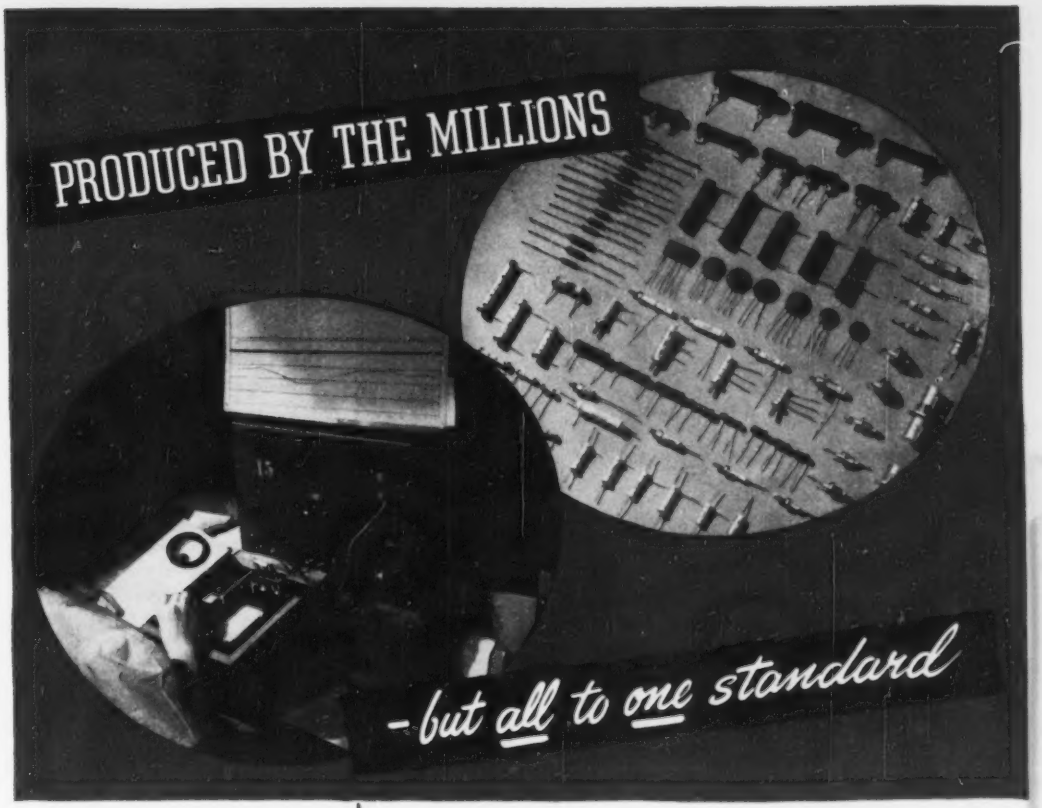
Convergence of the circularly deflected beam is produced by a magnetic lens in the single-gun kinescope instead of the electrostatic method employed in the three-gun version. A coil similar to the focus coil normally employed in conventional black-and-white receivers is used for this purpose. The dynamic convergence variation is likewise applied magnetically in this tube and is introduced by means of a smaller auxiliary coil located near the main convergence coil. As in the previous receiver, the dynamic convergence waveforms are derived from the deflection circuits.

Both tube types are fabricated in 16-inch metal cones and produce pictures approximately 9 by 12 inches.

Circuits of Phonevision System

PHONEVISION is a method of applying secrecy to a television transmission so that the modified signal from a conventional transmitter can be received as a clear, intelligible picture only on a receiver supplied with a correcting signal over a secondary control link.

One method of incorporating secrecy or privacy in a video signal is to modify the original signal by producing a deliberate change in the relation of video and horizontal or vertical synchronizing signals. In this case, a key signal is sent to the television receiver via a second



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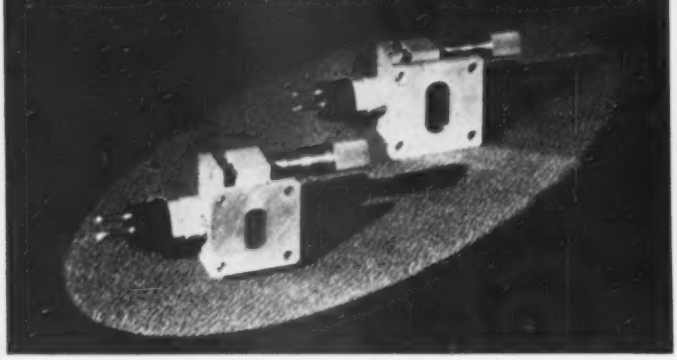

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Electrical Characteristics

	X-13	X-12
Beam Voltage	500 volts, max	600 volts, max
Beam Current	60 ma, max	60 ma, max
Heater Voltage	6.3 volts	6.3 volts
Heater Current	1.1 amp	1.1 amp
Reflector Voltage	0 to —1000 volts	0 to —1000 volts
Tuning Range	8,100-12,400 mc min	12,400-17,500 mc min
Power Output	100 milliwatts, min with transformer	10 to 100 milliwatts

Mechanical Specifications

Cathode	Oxide coated, unipotential	Oxide coated, unipotential
Clearance dimensions	3½ x 2½ x 2½ in.	3½ x 2½ x 2½ in.
Weight	6 ounces	5 ounces
Output Flange	Mates with standard flange for 1 x ½ x 0.050 in. waveguide	Mates with standard flange for 0.702 x 0.391 x 0.040 in. waveguide
Cooling	Forced air cooling required for beam power inputs exceeding 10 watts	Forced air cooling required for beam power inputs exceeding 10 watts
Mounting position	Any	Any

Typical Operation

Frequency	10,000 mc	16,000 mc
Beam Voltage	400 volts	600 volts
Beam Current	48 ma	50 ma
Reflector Voltage	575 volts	280 volts
Power Output	230 milliwatts	25 milliwatts
Load VSWR	Less than 1.1	
Modulation Bandwidth	30 mc	50 mc
Temperature coefficient	Less than 0.25 mc per degree C	

Not illustrated, X-21 klystron. Five-watt two-cavity oscillator. Weight approximately 4½ ounces. Specifications upon request.

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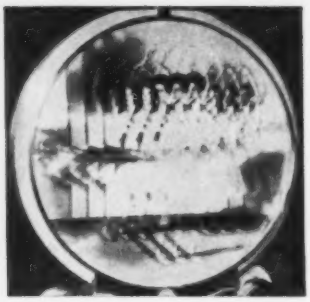
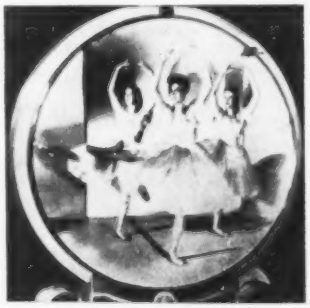


Television picture without Phonevision coder

path to inform the set when this change is to occur so that a correction may be made for it.

In the Phonevision system developed by Zenith engineers, the video information is shifted at times with respect to the horizontal synchronizing pulses. The shift introduced amounts to a small percent of the horizontal period. The picture is therefore transmitted in either of two modes in one of which the video information appears normally phased with respect to the horizontal synchronizing pulses, while in the other a phase shift is introduced between the video and horizontal synchronizing pulse.

Change from mode to mode is made at a random sub-field rate. For example, for three or four fields the picture may be transmitted with a phase shift between video and synchronizing signals followed by two fields with normal phase relation. The changing between modes is entirely random and is determined by a noise source so as to give the system secrecy. The resulting scrambled picture with this type of transmission is one in which the image is moving back and forth



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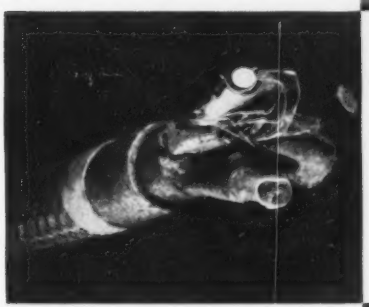

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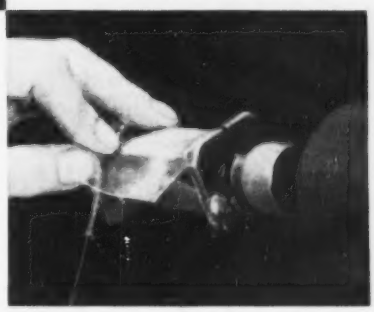

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horizontally at a slow irregular rate, producing an annoying blurred effect.

The change between modes is accomplished during the vertical blank period, thereby giving all circuits adequate time to stabilize. Accompanying one of the two modes of transmission is a key signal which consists merely of a tone of any frequency substantially higher than the field frequency. This key signal is sent via a secondary link to the Phonevision receiver.

At the Phonevision receiver the key information is used to cause circuits to compensate for the phase shift introduced between video and horizontal synchronizing pulses. Therefore, when the video is being sent out, shifted with respect to the horizontal synchronizing pulses, the start of the horizontal sweep in the receiver is correspondingly changed. Absence of the key signal indicates normal phase between the video and the horizontal synchronizing pulses.

Transmitter

As shown in the block diagram, Fig. 1, a typical transmitter consists of a normal crystal oscillator stage, followed by r-f amplifiers, multipliers and modulator. The studio consists of some type of pickup tube, an iconoscope or equivalent. The heart of the studio gear is the synchronizing signal generator in which the sync pulses, both horizontal and vertical, and blanking pulses, are generated. Vertical sync pulses are supplied to the vertical sweep circuits directly with no change in this portion of the circuit. However, the horizontal sync pulses, instead of being fed directly into horizontal sweep-forming cir-

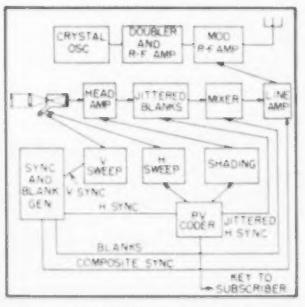

FIG. 1—Block diagram of typical Phonevision transmitter

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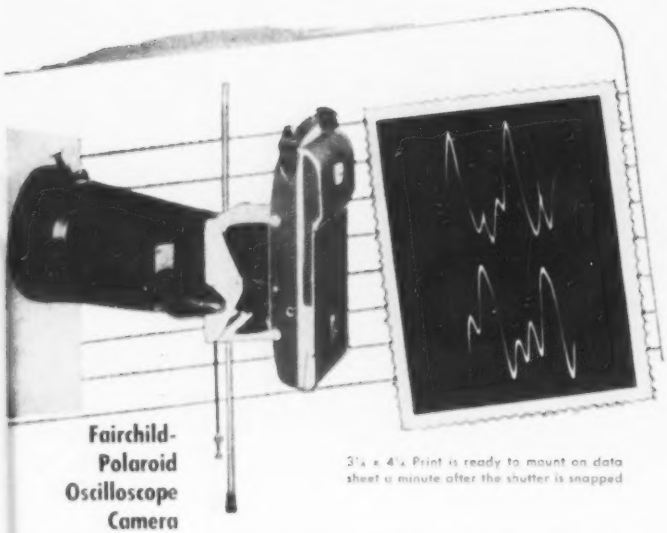

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3¼ x 4¼ Print is ready to mount on data sheet a minute after the shutter is snapped

Fairchild now offers an inexpensive oscilloscope camera that gives you accurate photographic records of waveshapes in almost as little time as it takes to sketch them from memory. Only one minute after the shutter is snapped, a print is ready to mount in your notebook. This permits you to evaluate oscilloscope "stills" immediately and then proceed with laboratory work.

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The complete Fairchild-Polaroid Oscilloscope Camera consists of a *scope adapter* to fit any five-inch oscilloscope, a *light-tight hood* with viewing port, and a *Polaroid-Land Camera body* with special lens and two-position shutter device.

Write today for complete details and prices on the ready-to-use F-284 Oscilloscope Camera Kit including camera, carrying case, and Polaroid film. *Fairchild Camera and Instrument Corp., 88-06 Van Wyck Blvd., Jamaica 1, N. Y.* Distributors: *Tektronix Inc., Portland, Oregon; Electronic Tube Corp., Philadelphia, Pa.*

Specifications

Lens — Special 75 mm. f/2.8 Wollensak Oscillo-anastigmat.

Shutter — Wollensak Alphax; speeds 1/25 sec. to 1/100 sec., "time," and "bulb."

Focus — Fixed (approx. 8 in.).

Picture Size — 3¼ x 4¼ in. (2 images per print, 16 exposures per roll of film).

Image Size — One-half reduction of scope image.

Writing Speed — to 1 in. usec at 3000V accelerating potential; higher speeds at higher voltages.

Dimensions — Camera, 10½ x 5¼ x 6¼ in.; hood, 11 in. length, 7½ in. dia.; adapter, 2 in. width, 6⅝ in. max. dia.

Weight — Complete, 7¼ lb.

Fairchild
CAMERA AND INSTRUMENT CORPORATION

cuits, pass through a new unit which forms jittered sync pulses, the Phonevision coder.

The output of the iconoscope is fed into a head amplifier in which mixing of video signals, plus the shading signal, is accomplished. The output of the head amplifier is fed into the jittered blank unit after which the signal passes to the mixer where steady blanks are added. At this point, control is also maintained over contrast and background setting. Synchronizing and blank generators also supply the composite sync signal to the video amplifier where the video signal from the iconoscope, plus the blanks, are mixed with the composite sync waveform. The entire composite video signal is then fed to the modulator. Also generated by the Phonevision coder is the key signal which is applied to the secondary control link and distributed to Phonevision subscribers.

Coder

Figure 2 is a block diagram of a typical coder unit comprising four primary sections as indicated by the dotted lines. In the first section is the random key generator, the heart of the Phonevision system as far as secrecy is concerned. Input to this portion of the unit consists of a normal vertical drive which is fed through an isolation stage and phase control to a blocking oscillator circuit. Combined with

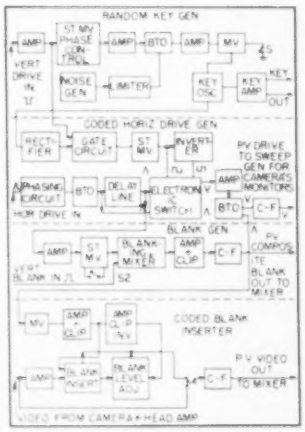
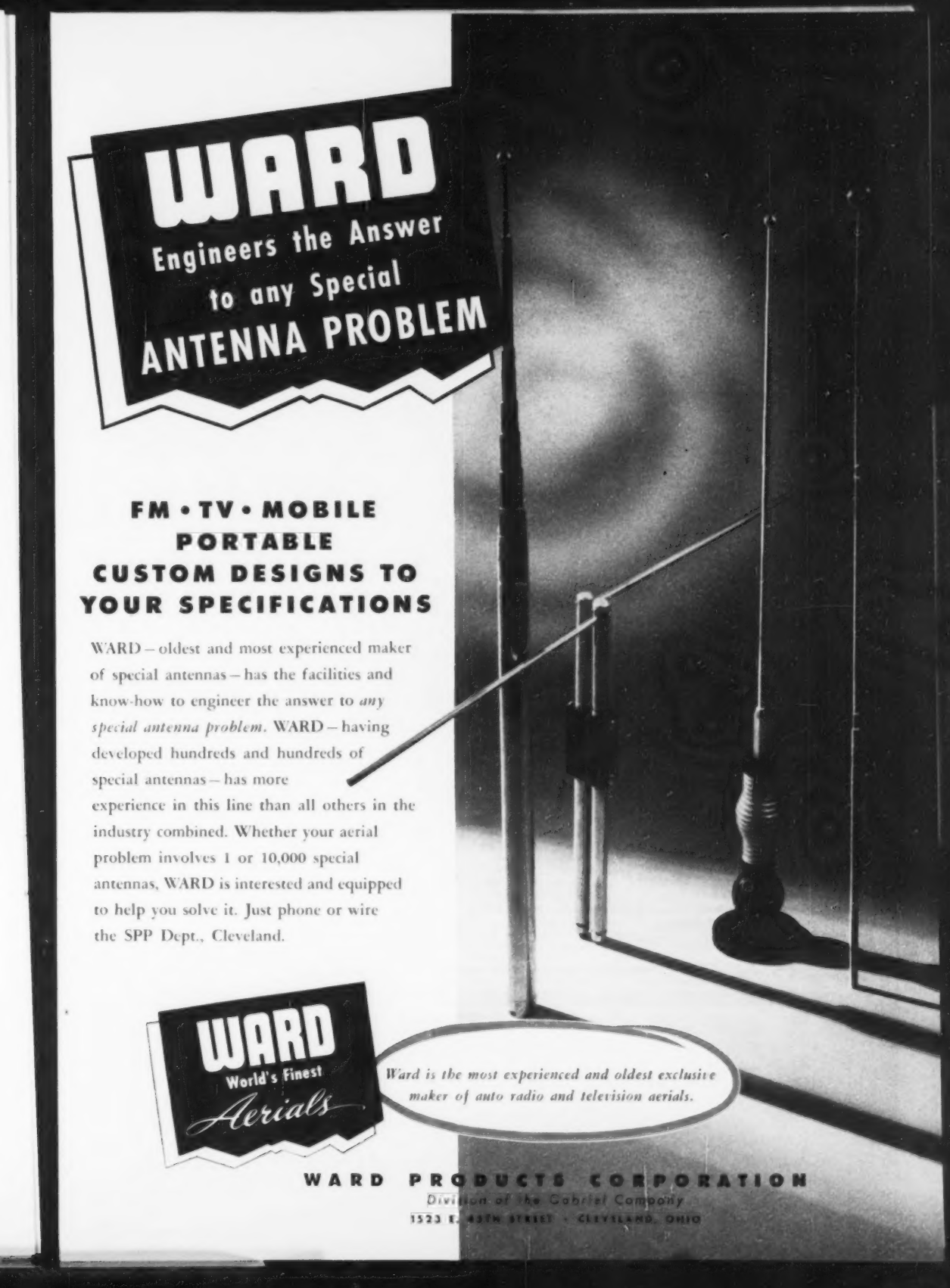


FIG. 2—Setup of stages in the four main sections of the coder unit for the transmitter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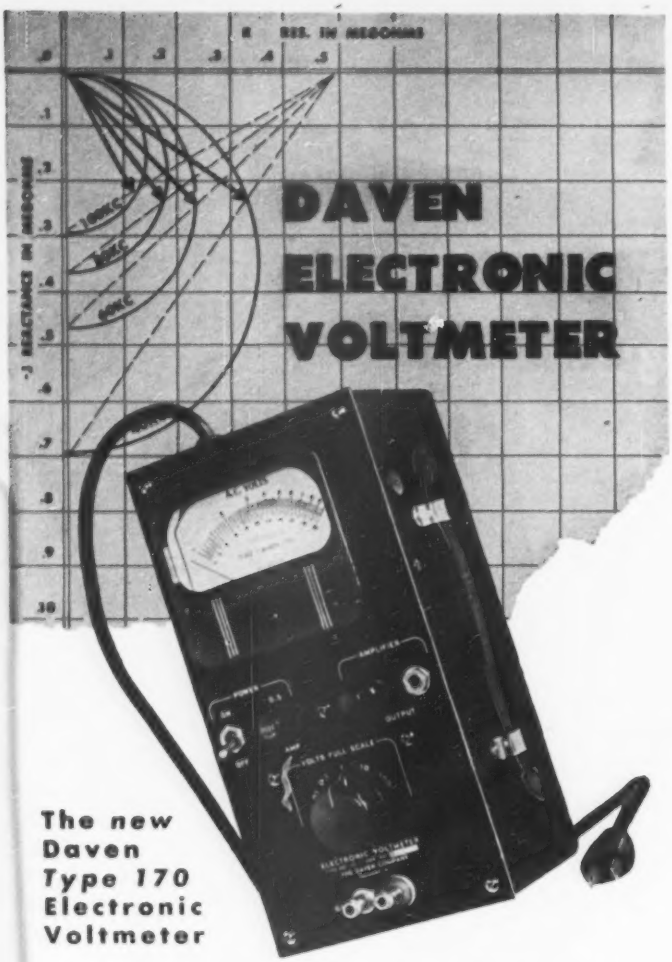

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the vertical pulse is the output of a noise generator. Combination of these two signals results in a pulse from the blocking oscillator occurring at random but only at the time of the vertical synchronizing signal.

By adjusting the noise signal by means of the limiter, the blocking oscillator can be made to operate between 60 and 20 times per second. Alternate signals from the blocking oscillator produce square-wave control signals by means of a multivibrator. The square wave in turn keys an oscillator operating at the key signal carrier frequency. The output from this oscillator is shaped in an amplifying stage to have a rise time of approximately two-thirds of a field period and is then distributed through the secondary control link.

Camera Drive

The output of the key oscillator is also fed to the second section of the coder which generates the coded horizontal drive used by the cameras, monitors and shading generators. The oscillator signal is combined with the vertical pulse in a gating circuit which in turn determines the points of transition of a single-trip multivibrator.

The vertical pulses out of the gate circuit are positive when the key signal is applied and negative in absence of the key. Application of the positive and negative pulses to one of the control grids of the single-trip multivibrator causes a change in mode of operation at the time of the first vertical pulse present with the key and the first vertical pulse after the key has been turned off.

A normal horizontal drive pulse is fed into the coded horizontal drive generator through a phasing circuit which produces a pulse shifted in phase with respect to the normal horizontal synchronizing pulse. A blocking oscillator triggered by the shifted pulse drives a long line having a delay equal to the time change desired in the video.

An electronic switch chooses either the pulse from the input or from the output of the delay line as directed by the single-trip multivibrator and in this way produces the coded horizontal drive.

The horizontal shift in the video

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(Meets low temperature requirement of -40°C when tested according to JAN-C-76)		
SLOW COMPRESSION TEST Actual force in pounds to ground	81.3	59.8
FLAME TESTS Horizontal Test	Self-extinguishing no falling particles	Self-extinguishing no falling particles
Vertical Test (As described in Underwriters' Standard for Thermoplastic Wires)	Specimens meet requirements satisfactorily	Specimens meet requirements satisfactorily
VOLTAGE BREAKDOWN TEST As received–2000 V/min. Ave. breakdown KV	No failure 23.9 KV (1/64" wall)	No failure 24.7 KV
After 60 days at 113°C-2000 V/min. Average breakdown KV	No failure 21.5 KV (1/64" wall)	No failure 24.0 KV
INSULATION RESISTANCE TEST 12 hrs. in water at 15.6°C Megohms/1000'	988 megohms	1270 megohms

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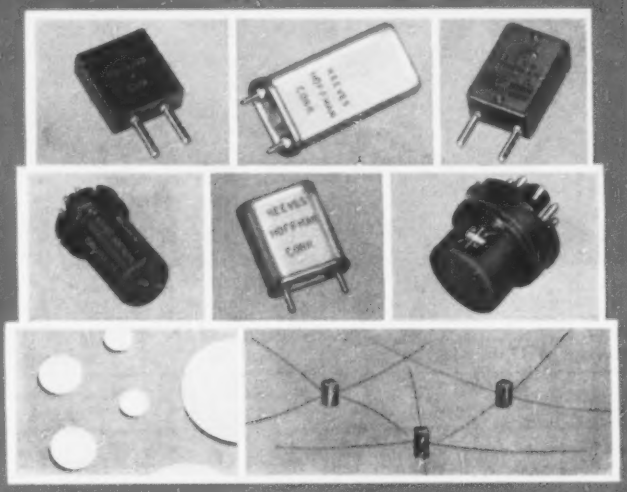

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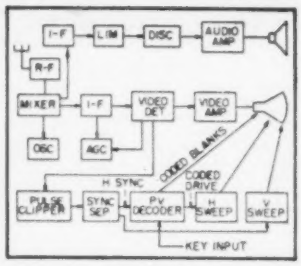

FIG. 3—A decoder is added to a normal receiver

is obtained by using time normally required for the horizontal blank pulse. This calls for a revised horizontal blanking signal of less width. The new blanks are generated in the third unit of the coder by feeding horizontal pulses from the output of the delay line through an isolation amplifier to a single-trip multivibrator.

Normal vertical blanking signals and the output of the single-trip multivibrator which forms the horizontal blank are mixed in the blanking mixer and then amplified and clipped and made ready for distribution through a cathode follower.

An additional requirement, that of coded blank insertion, is taken care of in the fourth section of the adapter. The output of the coded horizontal drive generator triggers a single-trip multivibrator by means of which coded blanks are obtained. Both polarities of the blank wave form are combined in two tubes having a common load impedance. Video from the camera chain is applied to the blank inserter and mixed with the coded blank.

The second section of the blank inserter adjusts the blank level, maintaining this level approximately at the average video point. After insertion of the coded blank the signal is distributed to the usual mixers through a cathode follower.

Receiver

A Phonevision receiver circuit, shown in Fig. 3, consists of the normal stages plus a decoder. The video detector is followed by the sync pulse separating circuit. The vertical pulse is separated in normal fashion and actuates the vertical sweep of the picture tube. The separated horizontal sync pulse is

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Greatest dimension of bulb	16⅝"
Minimum useful screen diagonal	15½"
Base	Duodecal 5 pin
Bulb contact	Recessed small cavity cap
Anode voltage	12,000 volts DC
Grid No. 2 voltage	300 volts DC
Focusing coil current	115 approx. ma. DC
Grid No. 1 circuit resistance	1.5 max. megohms

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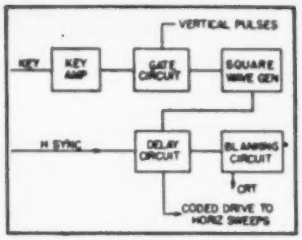

FIG. 4—Stages of the decoder unit at the receiver

fed into a decoder unit. This unit, actuated by the key signal coming over the secondary link to the receiver, applies a correction to the horizontal sync pulse which triggers the horizontal sweep circuit.

A block diagram of a typical decoder unit is shown in Fig. 4. Since the level of the key signal from the control link is approximately 50 millivolts, the decoder is preceded by a stage of gain. A gating circuit combines the key information with the vertical pulse obtained from the television receiver to trigger a square-wave generator. The gating circuit and square-wave generator have the unique property of being able to detect the first vertical pulse in presence of key and the first vertical pulse in absence of key. Thus the square-wave generator will change modes of operation as dictated by the key information and will at the same time be synchronized with the transmitted vertical sync signals. The resulting square wave controls the phase of pulses obtained from the normal horizontal sync circuits of the receiver and thereby controls the drive to the horizontal sweep of the picture tube. Proper amount of phase shift controlled by the key corrects for the phase shift originally inserted in the transmitter by the coder.

A blanking circuit is also provided which is controlled by the coded horizontal pulses and restores the blanking interval to normal width.

Distribution of Key Signal

The method of distribution of the key or decoding signal in the Phonevision system is to superimpose it upon the regular telephone line of a customer. Since the key signal required needs only about 120 cycles

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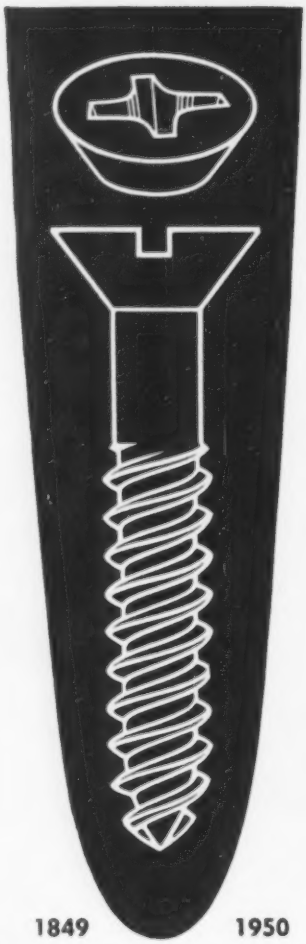

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of spectrum space, it can be added immediately above the normal voice band. The attenuation at this frequency in the usual telephone subscriber plant is well within the limits required to permit sensing the decoding signal at the customer's home. Frequency separation networks of simple type have been produced to do this with low insertion loss. This is one possible means of extending the decoding signal to the user.

Time Scale for Watches

A GERMAN inventor claims he has developed a new electric-acoustic apparatus enabling watchmakers to set the speed of watches within three minutes, a job which normally takes 24 hours. A control watch and the customer's watch are fastened to microphones which feed their strokes into the headphones of

Speed of watch strokes are checked by a technician

the watchmaker who hears if there is any defect.

As soon as the strokes of the watches coincide, the pointer on the meter scale starts to move. It stops when the strokes coincide again and the watchmaker then can read how many minutes the customer's watch is slow or fast. The instrument was invented and is being made by Alfred Drieselmann of Hamburg-Rahlstedt, Schwerinerstrasse. It costs about $600. A girl mechanic is operating the machine shown in the photograph.

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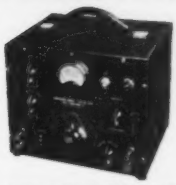

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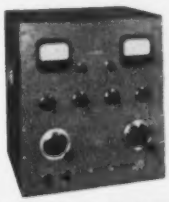

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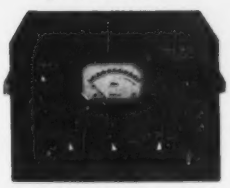

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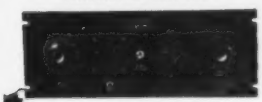

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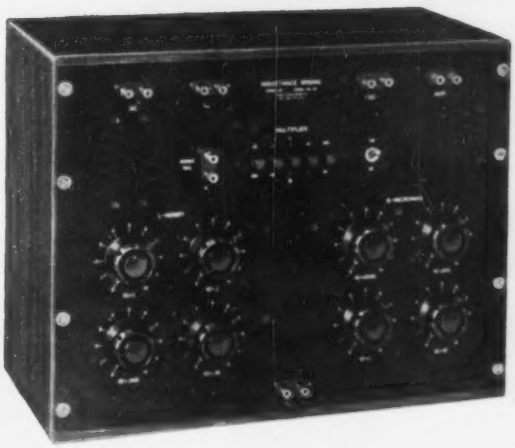

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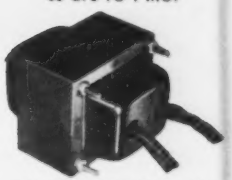

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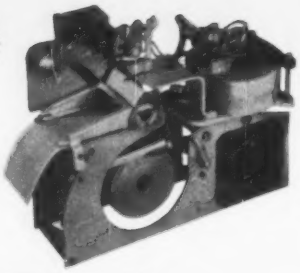
This recorder assembly may be obtained in bare chassis form, as illustrated (51-600) with or without built-in timer; or, with the addition of a stylus heating transformer, temperature controls, and control panel (127); or, with the entire assembly, controls and control panel enclosed in a mahogany carrying case (127C). Complete catalog available, see below.



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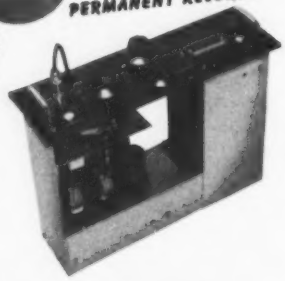
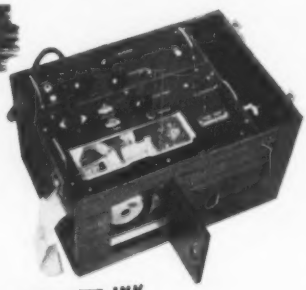
INSTRUMENT AMPLIFIERS

A general purpose, A.C. operated driver amplifier for use with model 127 Recorder, comprising three direct coupled push-pull stages. Maximum sensitivity 50 mv. per cm., minimum sensitivity 50 volts per cm., with four intermediate ranges. Balanced input terminals available with impedances of 5 megohms to ground. Complete information in catalog shown below.



AMPLIFIER-RECORDERS

Model shown at right is a single channel unit comprising above Amplifier 126 and Recorder 127, contained in one mahogany carrying case, and designed for use in the industrial field as a direct writing vacuum tube recording voltmeter capable of reproducing any electrical phenomena from the order of a few millivolts to more than 200 volts. More complete data in catalog shown below.



At lower right is a typical "Poly-Viso" multiple channel direct writing Recorder and Amplifier in console. Numerous combinations of this recording equipment and associated amplifiers and accessories are available. The Multi-channel Recorder (Model 165) provides for the simultaneous registration of *up to four* input phenomena, using the same principles and method as for the Recorder Assembly above. In addition, the "Poly-Viso" Recorder provides a selection of eight paper speeds: 50, 25, 10, 5, 2.8, 1.0, 0.5 and 0.25 mm/sec., and for the use of 4, 2, or 1 channel recording Permapaper. The Amplifier equipment is housed in a rack which has space for four individual driver amplifiers (electrically identical to model 126, above) and one 4-channel preamplifier.

MULTI-CHANNEL — NO INK — RECTANGULAR COORDINATES — PERMANENT RECORDS

For complete catalog giving tables of constants, sizes and weights, illustrations, general description, and prices, address:

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THE ELECTRON ART
(continued from p 124)

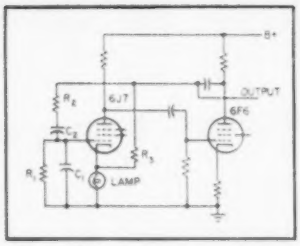


FIG. 1—Basic circuit of a well-known resistance-tuned oscillator to which bandspreading will be added

frequency at which the 6J7 grid voltage is in phase with the 6F6 plate voltage. The Wien bridge network, RCR_2C_2, determines the frequency at which these two voltages are in phase. The frequency is made smoothly variable through the use of a standard type of ganged variable air capacitor for C_1 and C_2. Each of these consists of two sections of a four-gang capacitor, with a maximum capacitance of 525 $\mu\mu$f per section.

Trimmers are used across C_1 and C_2 for the purpose of calibration and maintenance of a constant amplitude of oscillation.

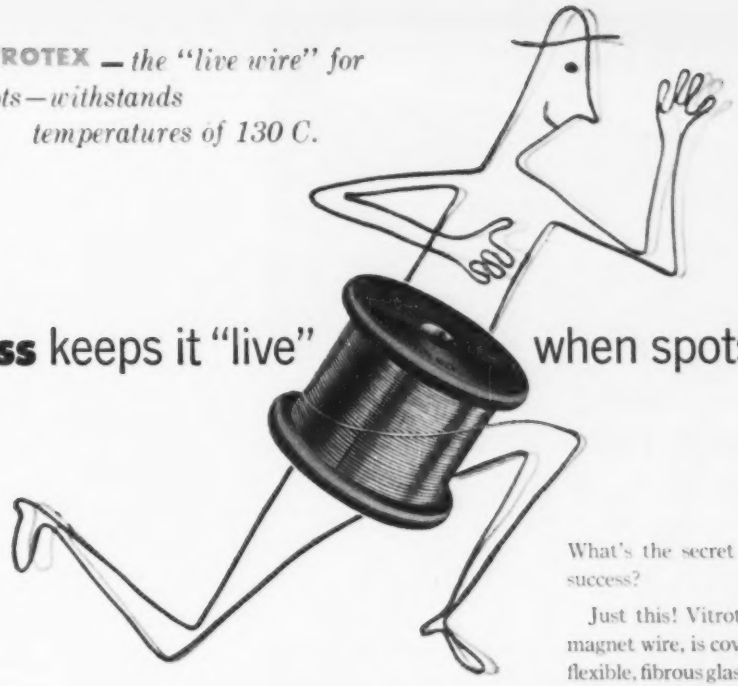
In modifying the oscillator, the most desirable method is to remove the original bandswitch, together with the tuning resistors assembled on it, and substitute another switch having the desired number of positions and circuits. The original resistors, or preferably new ones, are then assembled onto the switch together with the extra components for the bandspread ranges. Additional tuning scales may then be placed on the frequency dial, or a new dial substituted.

Bandspread Computations

In the original tuning circuit of the oscillator, all of the tuning component values are specified in the manufacturer's instruction book except the ΔC of the tuning capacitor, and the minimum capacitance, C_{min}, across C_1 and C_2 each when the tuning capacitor is set to the high-frequency end of the dial. The values of ΔC and C_{min} are obtainable by simple calculation: $C_{min} = 86$ $\mu\mu$f and $\Delta C = 1{,}019$ $\mu\mu$f. Values of components for any desired bandspread range may now be readily calculated.

Example: Calculate a tuning cir-

VITROTEX — *the "live wire" for hot spots—withstands temperatures of 130 C.*



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What's the secret of its heat-resistant success?

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The smooth surface of Vitrotex successfully resists abrasion, moisture, acids, oils and corrosive vapors . . . and its tightly wound coils provide safer operation in confined areas under high heat.

Contact your nearest Anaconda Sales Office or Distributor for information on Vitrotex and the entire line of Anaconda Magnet Wire. Anaconda Wire & Cable Company, 25 Broadway, New York 4, New York, or 20 N. Wacker Drive, Chicago 6, Illinois.

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WIRE AND CABLE

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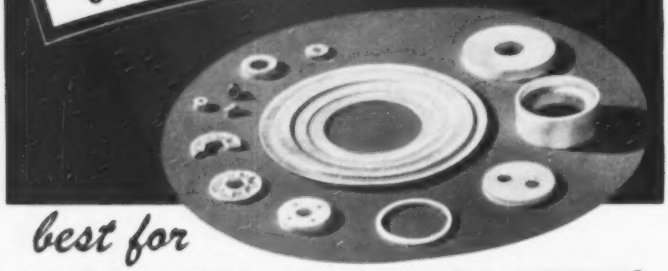

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Teflon insulators combine low dielectric constant, low loss factor, high heat resistance, toughness and resiliency.

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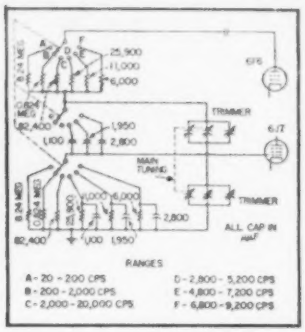


FIG. 2—Complete bandspread circuit covering 3 to 5, 5 to 7 and 7 to 9-kc ranges in addition to original bands

cuit to produce a range of 3,000 to 5,000 cycles for a complete rotation of the tuning capacitor.

$$\frac{f_{max}}{f_{min}} = \frac{C_{min}' + \Delta C'}{C_{min}'}$$

$$C_{min}' = 1,529\ \mu\mu f$$

The tuning circuit already contains a C_{min} of 86 $\mu\mu f$. Therefore, a fixed capacitor of $1,529 - 86 = 1,443\ \mu\mu f$ must be added across each two sections of the tuning capacitor.

The tuning resistors are selected to give a frequency of 5,000 cycles with the tuning capacitance at minimum, which is 1,529 $\mu\mu f$.

$$R = \frac{1}{2\pi fC} = 20,900 \text{ ohms}$$

The complete bandspread circuit including the switching is given in Fig. 2. The values indicated obtain three ranges of 3,000 to 5,000, 5,000 to 7,000, and 7,000 to 9,000 cycles, with approximately 10 percent overlapping of ranges. All of the fixed resistors and capacitors are mounted directly on the switch, as shown in Fig. 3.

Selection of Components

Resistors and capacitors for bandspread circuits must be selec-

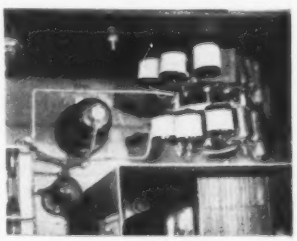
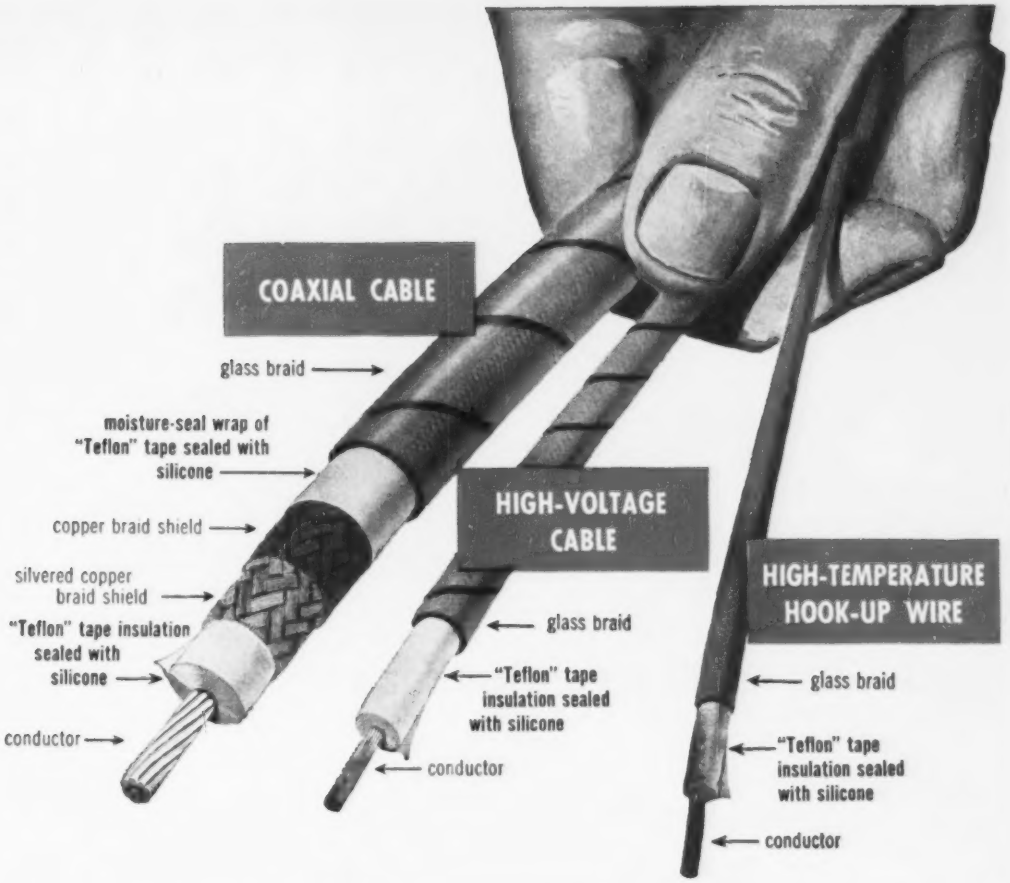


FIG. 3—All frequency-determining components are mounted on bandswitch



"TEFLON"* TAPE INSULATION SERVES FROM –80° TO 500°F.

No other available material has the combination of low electrical losses and heat-resistance of Du Pont "Teflon" tetrafluroethylene resin.

"Teflon" tape is seeing wider and wider use in such applications as insulation for wire and cable, ground insulation for motors and generators, conductor and layer insulation in transformers and coils. Its power factor is less than 0.0005 and its dielectric constant only 2.0 over the entire spectrum measured to date, 60 cycles to 30,000 megacycles. Its dielectric strength is excellent and is unaffected by temperature changes up to at least 400°F. The tape gives service up to 500°F. "Teflon" tape has excellent mechanical strength and pliability . . . at temperatures as low as –80°F. In wrapped construction it fits even more tightly as the temperature is raised. It has zero water-absorption, and is unaffected by outdoor weathering.

"Teflon" is supplied by Du Pont in the standard shapes of rods, tubes, sheets, beading, and tape, and in molding powder, both shredded and granular. WRITE NOW for more data on the properties and electrical uses of "Teflon"!

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(Wire and cables shown above made with "Teflon" Tape by Boston Insulated Wire & Cable Co., Boston, Mass.)

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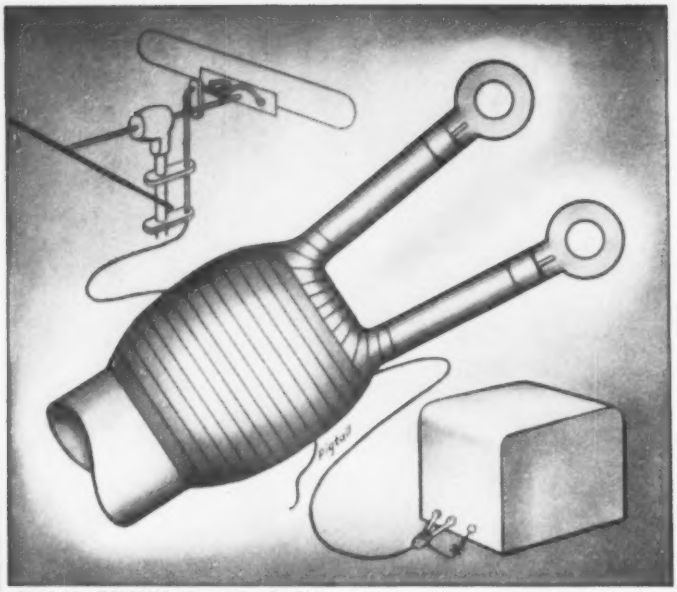

FEDERAL TELEPHONE AND RADIO CORPORATION'S shielded balanced 300-OHM lead-in, lap-wrapped with "Scotch" No. 33 Plastic backed Electrical Insulating Tape to prevent moisture from condensing under cable jacket.

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Try "Scotch" No. 33 Electrical Tape on your next installation. Find how this amazing tape can simplify your television and radio work. A letter to us will bring complete information — with no obligation. Write Dept. ES-650.

Quick facts about "SCOTCH" No. 33 Electrical Tape

- **THIN CALIPER**—only .007 in. thick, makes a neat, tight wrap.
- **HIGH DIELECTRIC STRENGTH**—over 7,000 volts.
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TIP—for perfect high-heat insulation try "Scotch" Electrical Tape No. 27 with Glass Cloth backing, thermosetting adhesive.

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ted with care. Particular attention should be paid to their temperature coefficients, for frequency drift due to warmup shows up much more readily on a bandspread than on a compressed scale. For example, a drift of 1 percent at 5,000 cycles will nullify the accuracy of a dial which may have initially been calibrated to an accuracy of 20 cycles.

It has been found most desirable to use wirewound resistors and silver mica capacitors as the tuning elements for the bandspread circuits. The resistors should be wound non-inductively, and of a wire with the lowest possible temperature coefficient. The writer has used resistors made with 331 Alloy, also known by the trade names of Karma and Evenohm. This wire has about the same temperature coefficient as manganin (0.00002 per C) but holds it over a wider temperature range than manganin. The silver mica capacitors should likewise have a zero temperature coefficient.

It has been found that at the upper end of the third bandspread range—9,000 cycles—that the drift over a two-hour period from a cold start is less than 20 cycles, or about 0.2 percent. This should prove satisfactory for most applications.

R-F Field Mass Spectrometer

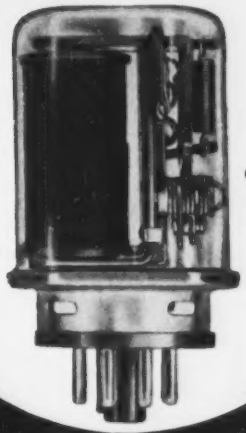
A THREE-STAGE nonmagnetic mass spectrometer, employing the principle of velocity selection, has been developed at the National Bureau of Standards. In the new spectrometer an r-f field replaces the usual magnetic field. Combining unusually simple operation with small size, light weight, and high sensitivity, the instrument has promising applications in several fields of science and industry.

The nonmagnetic mass spectrometer uses neither bending nor focusing. Ions produced in the ionization chamber travel in parallel paths through the tube, a glass cylinder 8 inches long and 2 inches in diameter. Three sets of three tungsten-wire grids are spaced along the tube to form the three stages. An r-f potential is applied

NEW SENSITIVE RELAY *built for long service*

SW RELAY

Hermetically Sealed



Supplied with **OCTAL PLUG or SOLDER TERMINALS**

Sensitivity Plus Dependability!

The new Allied SW relay offers an economical combination of both these important qualities. Here are the facts on this newest relay in the famous Allied line.

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Be sure to send for your copy of Allied's new Relay Guide. It shows 24 small, compact relays with a detailed table of characteristics and specifications.

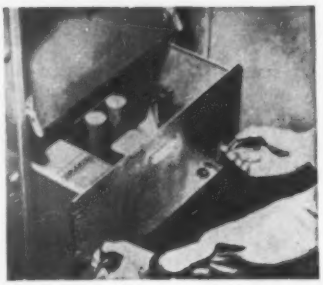
SENSITIVITY:	S.P.D.T. .012 watts d.c. } Can be supplied D.P.D.T. .05 watts d.c. } in A.C.
COIL:	Acetate insulated, bobbin or layer wound, 12,500 ohms max.
CONTACTS:	Silver, one ampere non-inductive load at 24 volts d.c. or 115 volts a.c. Armature contact at frame potential.
MOUNTING:	One hole with locating lug. Also available with dust cover or hermetically sealed, plug-in or solder terminals.
DIMENSIONS:	Open Relay—1-19/32", 1-1/16", 1-7/16" Sealed Relay—3-3/16" long, including plug, 1-13/32" wide, 1-19/32" high.
WEIGHT:	2.5 oz.
WEIGHT HERMETICALLY SEALED:	4.5 oz.
SPECIAL APPLICATIONS:	Sensitivity down to .003 watts S.P.D.T., or .012 watts D.P.D.T. Palladium or other precious metal contacts for audio or low voltage circuits, tungsten or alloy contacts for higher current or voltage circuits. Maximum input 4.0 watts at 20°C for 85° rise.

ALLIED CONTROL COMPANY, INC.

2 EAST END AVENUE, NEW YORK 21, NEW YORK

MODERN ELECTRONIC DESIGN MEANS PLUG-IN UNIT CONSTRUCTION

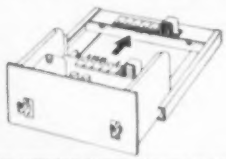
With basic elements as units—that plug-in, slide-in, lock-in, break away *easily*—so that electronic equipment is *instantly accessible*—ready for rapid checks, servicing, and unit replacement.



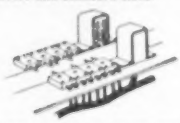
More and more engineers are finding that *plug-in unit construction* is the type of design that makes many of the new complex electronic projects feasible to operate and maintain. It's also recognized that *plug-in, unit principles* make present electronic equipment much more practical for wider general use.

Up to now there has been no one place where components *specifically designed* for *plug-in, unit construction* were available. To get this type of construction—it has been necessary for engineers to design and have parts custom made or improvise with standard components in make shift arrangements.

Here at Alden's we are designing and manufacturing components for *plug-in unit construction*. We are setting up to work with manufacturers on as many of these problems as possible. Very frankly, much of our work is still in the pilot run stage—but, in every instance—proven in use. If you don't see the answer to your problems here—let us work it out with you.



Rack connected chassis—become instantly accessible. Half twist of handles brings chassis into place or ejects—no matter how heavy. Built for racks or as separate units—miniature and standard sizes.

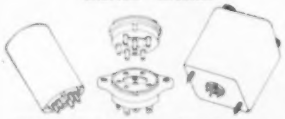


Rugged color coded back connectors—make and break circuits—provide rapid circuit checks. Wide mating tolerances compensate for any chassis misalignment. Miniature and heavy duty sizes.

Top operated clamps for tubes and plug-in units. Take minimum of space. Can be operated in cramped locations. Free floating—orients unit to socket without straining or bending pins.

Alden Cap Captive Convenience Screws—Hold miniature chassis, heavy plug-in cans or detachable mechanical units securely. Assemble easily in production by power tools—yet any tool or coin services in field.

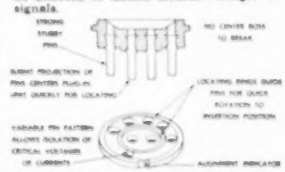
At last—a base specifically designed for plug-in units. No more broken bosses, bent pins, "shorted" circuits.



More and more engineers have been unitizing the basic elements of their circuits into compact, easily replaceable plug-in units. Since the conventional octal and tube socket bases have been the only component readily available, they have been constantly plagued by the broken bosses, bent pins, and "shorted" circuits caused by these bases.

This suggested an entirely new approach was necessary, so we went to work with some of these engineers. Out of this work the *Alden-Noninterchangeable plug-in base* was developed.

Pins have been made strong and stubby—for long, rugged use. The boss is eliminated entirely. Slight lead of center pins and locating rings with marker in the socket allow quick lining up of plug-in units. Further, this base is supplied with 2 to 11 contacts—in variable pin patterns—so that even where the same number of contacts are used, the pin layout may be varied so only the correct unit will mount in its proper socket. Pin patterns can even be selected to isolate critical voltages or signals.



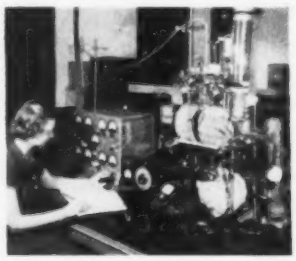
Write today for literature and samples. Let Alden work with you on your components for *plug-in, unit construction*.

Write for new booklet on "Components for Plug-in Unit Construction"

ALDEN PRODUCTS CO. 117 NORTH MAIN ST. BROCKTON 64, MASS.

to the middle grid in each stage. An additional grid, with a negative potential applied, follows that final stage and in the absence of r-f potential turns back any electrons that may have arisen anywhere along the tube. Following the final grid is a collector plate whose potential is sufficiently positive to repel all but the desired positive ions.

The distances between grids and between stages are selected very accurately so that for any particular ion mass there will be a single definite frequency of the r-f potential which can speed up ions of that



The three-stage nonmagnetic mass spectrometer in experimental operation at the National Bureau of Standards

mass as they pass through each stage. The increased speed of these ions enables them to overcome the opposing potential on the collector while all other kinds of positive ions are turned back. Successive distances between stages must be chosen so that the r-f potential will complete an exactly integral number of cycles during the time it takes for an ion of the desired mass to travel between stages, picking up maximum energy in each stage.

The spectrometer can make use of all the ions that can be made to emerge through a grid several centimeters in diameter, and a new kind of positive ion source has been developed to take advantage of this. A spiral filament delivers an ionizing electron current of 100 milliamperes through a double grid attached at one end of a hollow metal cylinder 3 centimeters deep. At a pressure of 4×10^{-5} millimeters of mercury the source delivers a positive ion current of 100 microamperes.

Applications

By an appropriate change in ion source and reversal of potentials,

UP TO 15 WATTS POWER OUTPUT WITH THIS BENDIX-PACIFIC **RELIABLE** TELEMETERING COMBINATION

These two new units are indicative of the engineering leadership Bendix-Pacific has established in the field of electronics.

The new 421250 Transmitter supplements a complete line of telemetering components in the Bendix-Pacific FM/FM subminiature telemetering systems and has a nominal power output of 2 watts. The total weight, including the case, is only .845 pounds and it measures 2" diameter by 5⅛" long.

The 421250 Transmitter can be tuned over the frequency range of 215 mc to 230 mc and is adaptable for use with current fed or voltage fed antenna systems. It has a line of sight range of up to 40 miles and may be used to drive the 421230 Power Amplifier.

The Bendix-Pacific 421230 Telemetering R. F. Amplifier has a nominal power output of 15 watts which provides adequate power for line of sight ranges of 40 to 100 miles. The tuning range matches that of the 421250 Transmitter. The total weight, including the case, is only 1.75 pounds.

The two transmitting units described above exemplify the building block method of telemetering system assemblies. Through the use of standard Bendix-Pacific components, the purchaser can readily assemble an instrumentation system exactly suited to his specific needs – thus effecting the utmost economy in volume, weight and cost.

RADAR BEACON

Bendix-Pacific has developed for restricted use an exceptionally small, compact radar beacon for use in the common radar bands to facilitate vehicle tracking.

Complete engineering facilities are available at Bendix-Pacific to assist you with special applications of these systems.

TO MEASURE...TO INDICATE...TO WARN...AT A DISTANCE

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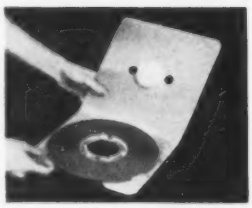
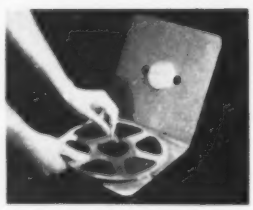
NOW you can get audiotape* in 2500-foot rolls!

...with 5 important advantages to all professional users

Plastic base, red oxide Audiotape is now available in professional-size, 2500-foot rolls — on standard NAB aluminum hubs or on complete 10½-inch aluminum reels. This latest addition to the complete Audiotape line offers you these 5 outstanding advantages:

1. *Exceptionally Low Cost*
2. *4% More Tape* than the usual 2400-foot roll
3. *Absolutely No Splices* in the entire roll
4. *Uniform Volume*—guaranteed not to exceed ±¼ db for the full reel, and ±½ db from reel to reel
5. *A Unique Package* (Pat. Pending), specially designed for easier and safer handling and storage





The folding inner container, shown above and at right, permits the tape to be placed onto the turntable of a machine without danger of its slipping from the hub or becoming unwound. It also permits tape to be transferred from turntable to package with equal ease and safety. What's more, the container is so designed that reel flanges can be attached to the hub quickly and easily, without danger of spilling the tape or dropping the sleeve screws. The package protects the tape in storage, too—prevents flattening of the bottom of the roll or damaging of the edges. This same type of package is also used for 5000-foot rolls of Audiotape.

Ask your dealer to show you the new professional size Audiotape. Or write to us for a free 200-foot sample reel of the tape and a descriptive sheet on the new container.

*Trade Mark

AUDIO DEVICES, INC.

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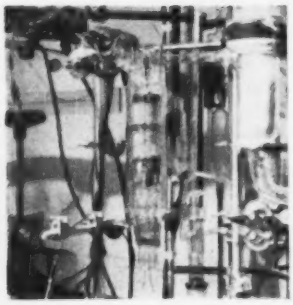


Close-up of a completed three-stage nonmagnetic mass spectrometer tube

the spectrometer works well for the study of negative ions, an important feature of the new instrument. Since negative ions are in general much less abundant, when they exist at all, the unusual sensitivity of the r-f field spectrometer is a great advantage in the study of negative ions.

In the development of vacuum tubes, as for example power transmitting tubes, such a spectrometer can be very helpful in analyzing gases and vapors that are evolved from the heated electrodes.

Surface reactions form another group of processes for which the new spectrometer can be used, separately analyzing the positively or negatively charged components. In gaseous discharges, the instrument can be used for direct analysis of the ions without magnetically disturbing the discharge.

One of the urgent needs of the U. S. Bureau of Mines is an instrument which can be used in the field for the analysis of small percentages of hydrogen in the manufacture of helium. The new spectrometer has already demonstrated adequate sensitivity and resolution for this task, and it can be readily adapted to automatic operation. Similarly, the new instrument could be used for continuous observation of the air in an enclosed space, giving warning of the presence of dangerous components such as hydrogen or chlorine. In addition, an active project is now under way at the National Bureau of Standards to adapt this instrument for use as an extremely sensitive carbon monoxide detector.

The lightness and compactness of the nonmagnetic spectrometer offers

versatile

Multi-channel -- telegraph A1 or telephone A3.

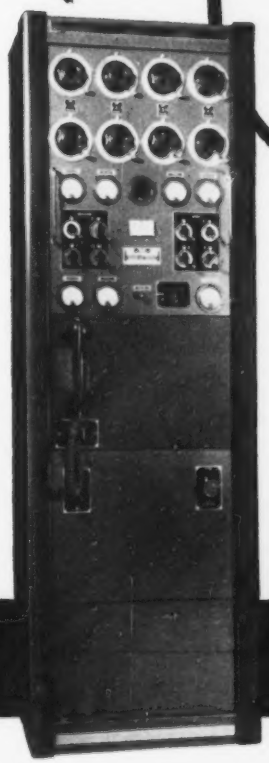
FROM GROUND TO AIR OR POINT TO POINT

STABLE

High stability (.003%) under normal operating conditions.

RUGGED

Components conservatively rated. Completely tropicalized.



Model 446 transmitter operates on 4 crystal-controlled frequencies (plus 2 closely spaced frequencies) in the band 2.5-13.5 Mcs (1.6-2.5 Mcs available). Operates on one frequency at a time; channeling time 2 seconds. Carrier power 350 watts, A1 or A3 AM. Stability .003% using CR-7 (or HC-6U) crystals. Operates in ambient 0° to + 45° C using mercury rectifiers; -35° to + 45° C using gas filled rectifiers. Power supply, 200-250 volts, 50/60 cycles, single phase. Conservatively rated, sturdily constructed. Complete technical data on request.

Here's the ideal general-purpose high-frequency transmitter! Model 446... 4-channel, 6-frequency, medium power, high stability. Suitable for point-to-point or ground-to-air communication. Can be remotely located from operating position. Co-axial fitting to accept frequency shift signals.

Consultants, designers and manufacturers of standard or special electronic, meteorological and communications equipment.

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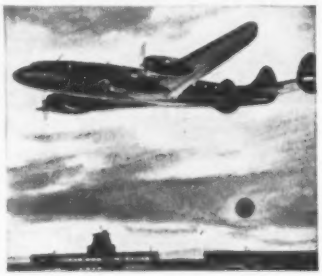

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a way to settle the question of the chemical composition of the upper atmosphere. This is a problem which is directly related to work in radio propagation and stratospheric flight. Arrangements have been made with the Applied Physics Laboratory of the John Hopkins University to send one of the new spectrometers aloft in a rocket. Before it is mounted in the rocket, the spectrometer tube will be evacuated and sealed; when the rocket has reached maximum altitude, an arm of the tube will be broken open to the rarefield air. The relative densities of atmospheric components will then be telemetered back to the ground for recording.

The nonmagnetic mass spectrometer is now being adapted to the rapid scanning of mass spectra. Present methods permit sweeping twice a second through the mass range from 10 to 50, displaying the measured mass components directly on the screen of an oscilloscope. The scanning is accomplished by sweeping the ion accelerating voltage from 50 to 250 volts while modulating the r-f potential with a 1,000-cycle signal.

Thermal Detector Response To Triangular Pulses

By NORMAN ALPERT
Servo Corporation of America
New Hyde Park, New York

THE RESPONSE of thermal detectors to triangular radiation pulses whose duration is 0.1 to 100 times the time constant of the thermal detector is best illustrated graphically. The following presents such information along with a representation of the effect of a 5-stage R-C coupled amplifier on the output from the thermal detector.

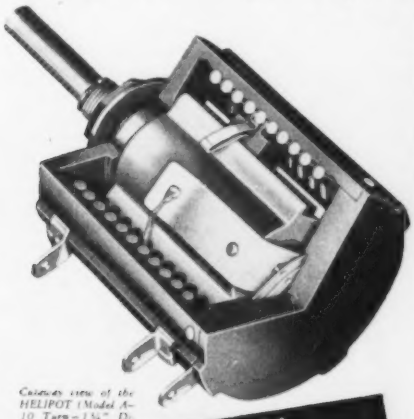
In general, the response to a unit step input of certain thermal detectors can be characterized by a single time constant as follows:

$$E_{out} = 1 - \epsilon^{-\frac{t}{T}}$$

where T is the thermal detector time constant. Hence the thermal detector can be represented by the equivalent circuit shown in Fig. 1A.

The response to a symmetrical

For new simplicity, wide range, and high accuracy in the control of modern electronic circuits...



Cutaway view of the HELIPOT (Model A-10 Turn—1¾" Diameter)

THE BECKMAN Helipot

(Trademark of the HELical POTentiometer)

Provides *many times* greater resistance control in *same* panel space as conventional potentiometers!

IF YOU are designing or manufacturing *any type* of precision electronic equipment be sure to investigate the greatest convenience, utility, range and compactness that can be incorporated into your equipment by using the revolutionary HELIPOT for rheostat-potentiometer control applications . . . and by using the new DUODIAL turns-indicating knob described at right.

Briefly, here is the HELIPOT principle . . . whereas a conventional potentiometer consists of a *single* coil of resistance winding, the HELIPOT has a resistance element *many times* longer coiled *helically* into a case which requires no more panel space than the conventional unit. A simple, foolproof guide controls the slider contact so that it follows the helical path of the resistance winding from end to end as a single knob is rotated. Result: *with no increase in panel space requirements*, the HELIPOT gives you as much as 12 times* the control surface. You get far greater accuracy, finer settings, increased range—with maximum compactness and operating simplicity!

COMPLETE RANGE OF TYPES AND SIZES

The HELIPOT is available in a complete range of types and sizes to meet a wide variety of control applications:

MODEL A: *5 watts, 10 turns, 46" slide wire length, 1¾" case dia., resistances 10 to 50,000 ohms, 3600° rotation.*

MODEL B: *10 watts, 15 turns, 140" slide wire length, 3⅛" case dia., resistances 50 to 200,000 ohms, 5400° rotation.*

MODEL C: *3 watts, 3 turns, 13⅓" slide wire length, 1¾" case dia., resistances 5 to 15,000 ohms, 1080° rotation.*

MODEL D: *15 watts, 25 turns, 234" slide wire length, 3⅛ case dia., resistances 100 to 300,000 ohms, 9000° rotation.*

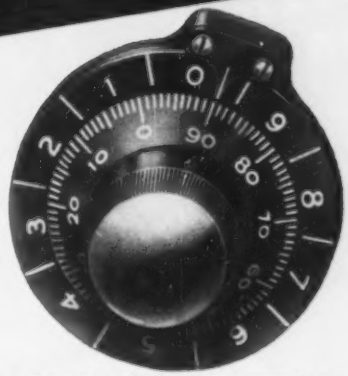
MODEL E: *20 watts, 40 turns, 373" slide wire length, 3⅛" case dia., resistances 150 to 500,000 ohms, 14,400° rotation.*

Also, the HELIPOT is available in various special designs . . . with double shaft extensions, in multiple assemblies, integral dual units, etc.

Let us study your potentiometer problems and suggest how the HELIPOT can be used—possibly is already being used by others in your industry—to increase the accuracy, convenience and simplicity of modern electronic equipment. No obligation, of course. Write today outlining your problem.

**Data for Model A, 1¾" dia. Helipot. Other models give even greater control range in 3" case diameters.*

THE BECKMAN Duodial



The inner, or Primary dial of the DUODIAL shows exact angular position of shaft during each revolution. The outer, or Secondary dial shows number of complete revolutions made by the Primary dial.

A multi-turn rotational-indicating knob dial for use with the HELIPOT and other multiple turn devices.

THE DUODIAL is a unique advancement in knob dial design. It consists essentially of a primary knob dial geared to a concentric turns-indicating secondary dial—and the entire unit is so compact it requires only a 2" diameter panel space!

The DUODIAL is so designed that—as the primary dial rotates through each complete revolution—the secondary dial moves one division on its scale. Thus, the secondary dial counts the number of complete revolutions made by the primary dial. When used with the HELIPOT, the DUODIAL registers *both* the angular position of the slider contact on any given helix as well as the particular helix on which the slider is positioned.

Besides its use on the HELIPOT, the DUODIAL is readily adaptable to other helically wound devices as well as to many conventional gear-driven controls where extra dial length is desired without wasting panel space. It is compact, simple and rugged. It contains only two moving parts, both made entirely of metal. It cannot be damaged through jamming of the driven unit, or by forcing beyond any mechanical stop. It is not subject to error from backlash of internal gears.

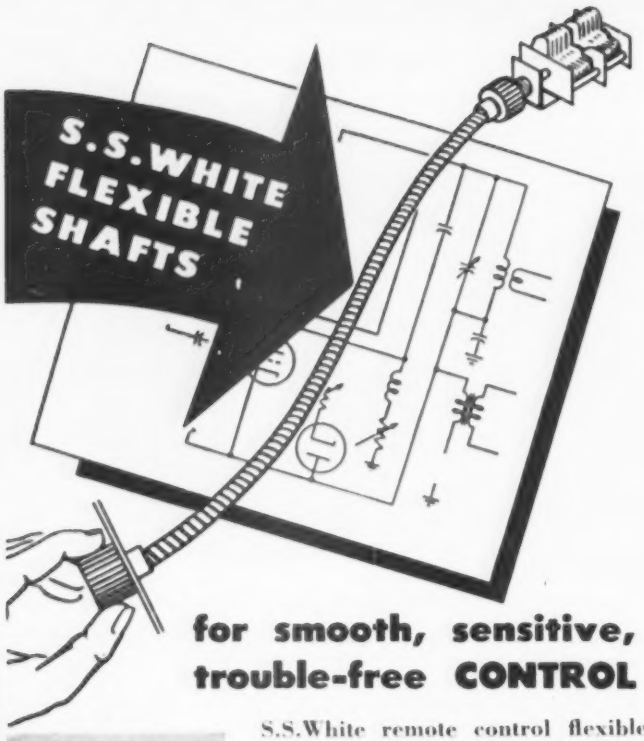
TWO SIZES — MANY RATIOS

The DUODIAL is now available in two types—the Model "R" (illustrated above) which is 2" in diameter, and the new Model "W" which is 4¾" in diameter and is ideal for main control applications. Standard turns-ratios include 10:1, 15:1, 25:1 and 40:1 (ratio between primary and secondary dials). Other ratios can be provided on special order. The 10:1 ratio DUODIAL can be readily employed with devices operating fewer than 10 revolutions and is recommended for the 3-turn HELIPOT. In all types, the primary dial and shaft operate with a 1:1 ratio, and all types mount directly on a ¼" round shaft.

Send for this HELIPOT AND DUODIAL CATALOG!

Contains complete data, construction details, etc., on the many sizes and types of HELIPOTS . . . and on the many unique features of the DUODIAL. Send for your free copy today!

THE Helipot CORPORATION, SOUTH PASADENA 2, CALIFORNIA



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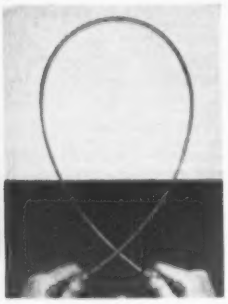

THE LOOP TEST

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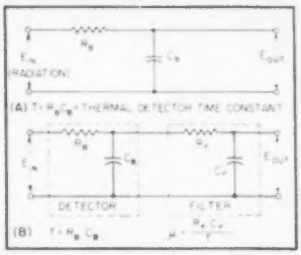


FIG. 1—Equivalent circuits for thermal detector *A* and for detector with low-pass filter *B*

triangular input pulse δT seconds wide can be obtained by Laplace Transform methods.

Figure 2A shows normalized curves of e_{out} vs time with δ as a parameter. It can be seen that for $\delta \geq 100$, the output follows the input very closely, while for $\delta \leq 0.1$ there is practically no output at all. Furthermore, the time lag for the peak instantaneous output to occur is greater the smaller the pulse width, δ.

Amplifier Response

The response of a thermal detector and five-stage R-C amplifier (where the amplifier time constant is 10 times the thermal detector time constant, or $\alpha = 10$) is shown by the normalized curves of e_{out} vs time with δ as parameter (Fig. 2B). It can be seen from a comparison of Fig. 2A and 2B that for $\delta = 2$, the amplifier faithfully reproduces the pulse output from the thermal detector except for a slight negative undershoot, while for $\delta = 20$, the

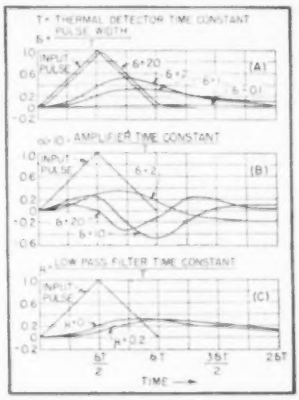
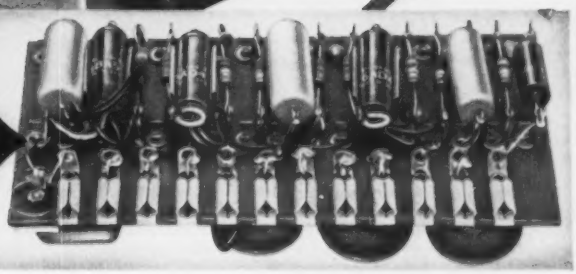


FIG. 2—Curves show response of thermal detector and five-stage amplifier to symmetrical triangular input pulses

GREAT LITTLE TUBES FOR A GREAT LITTLE INSTRUMENT



Here is the heart of the SoundScriber "Tycoon". Note how Sylvania's three subminiature tubes (1-6BA5 and 2-6AD4's) are mounted directly on the plastic card—allowing all-round compactness of design.

Sylvania's subminiature tubes are one of the secrets that enable SoundScriber to make the world's lightest, most compact dictation instrument. Only 15 lbs., the "Tycoon" covers as little desk space as an ordinary letter. Such concentration of electronic efficiency is typical of the advantages offered by Sylvania's subminiature tubes.

The "Tycoon" also owes much of its reputation for reliability to the Sylvania subminiatures that serve it . . . for they are lightweight little wonder-workers that stand up to heavyweight treatment.

In electronics, wherever compactness demands minimum size . . . wherever dependability is wedded to economy . . . you'll find Sylvania subminiatures at work, cutting space, cutting costs, cutting servicing requirements and replacement. Write Sylvania Electric Products Inc., Dept. R-2106, Emporium, Pa.

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Completely electronic in operation; has no moving parts. Offers instantaneous action, to maintain output voltage to within ±0.1 volts of nominal for any line voltage variations; to within ±0.15 volts for any load current change or load power factor change from .5 lagging to .9 leading. Waveform distortion *never* exceeds 5%.

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undershoot attains considerable proportions. When $\delta = 10$, the magnitude of the peak negative undershoot is almost twice as great as the first positive peak, while for $\delta = 20$, the undershoot is three times greater. In addition, the positive overshoot which occurs in the latter case is more than twice the first positive peak.

Inspection of Fig. 2B reveals that δ must be between 1 and 20 for reasonable pulse outputs which could be detected above noise.

The value for a was chosen as 10 from considerations of a typical thermal detector time constant of about 10 milliseconds and could easily be attained with a 0.05 μf capacitor and a 2 megohm resistor. The use of larger capacitors and resistors to increase the amplifier time constant and thus improve the response to pulses of longer duration is not recommended because of leakage resistance, grid current and because of their large physical size.

Summary of Figures

Figure 3 is a resume of Fig. 2A and 2B to an actual time scale. The pulses are shown in their relative time domains rather than on a normalized basis in order to provide a better insight into the relative effects on the input pulse of the thermal detector and five-stage R-C amplifier.

It should be noted from the curves that for relatively small

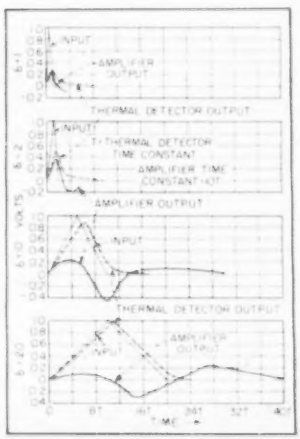
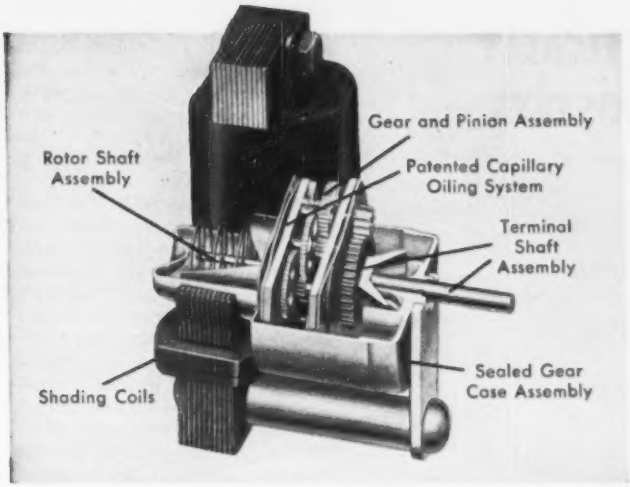
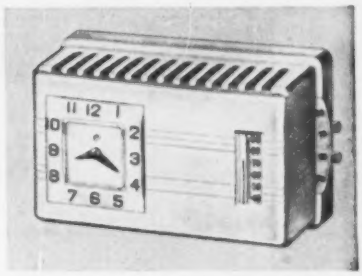


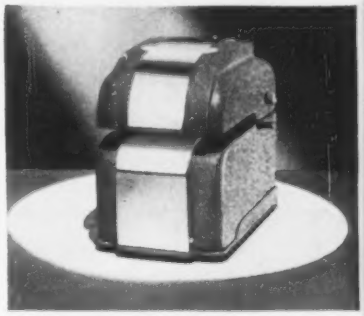
FIG. 3—Curves of pulses in relative time domain for detector and amplifier



Telechron Type B Synchronous Motor. For switches, recording-controlling mechanisms and other medium duty controlling purposes. Other models available with lower or higher torques for light or heavy duty applications.



Controlling the timing of heat regulators is typical of the jobs well done by Telechron Type H3 light duty motors.



Most time-stamps and recorders owe their accurate timing to Telechron Type B motors because such applications demand a motor that is instantly, constantly synchronous.

Unique Oiling System Prolongs Timing Accuracy

Capillary action in the spaces between each bearing and capillary plate of Telechron Timing Motors draws a specially formulated oil from the reservoir at the bottom of the sealed gear case. This keeps bearings and pivot surfaces constantly covered with a thin coating of oil. Oil creepage along the shafts, pinions and gears maintains complete, continuous lubrication. Brass terminal gear baffles meter the right amount of oil to the terminal shaft bearing . . . cutting down bearing wear and making the sealed-in oil supply last for years.

This oiling system is just one of many reasons why *all Telechron Timing Motors are instantly, constantly synchronous* . . . and why designers concerned with split-second timing or precise control of lightweight moving parts invariably specify Telechron motors.

If accurate timing enters into your product design, talk things over with a Telechron Application Engineer. Backed up by the experience that makes all electric timing possible (virtually all frequency-controlling master clocks in power stations are made by Telechron), he can probably show you how to save time and money by fitting a standard Telechron motor into your product. In the meanwhile, get complete data by mailing the coupon below. Telechron Inc. A General Electric Affiliate.

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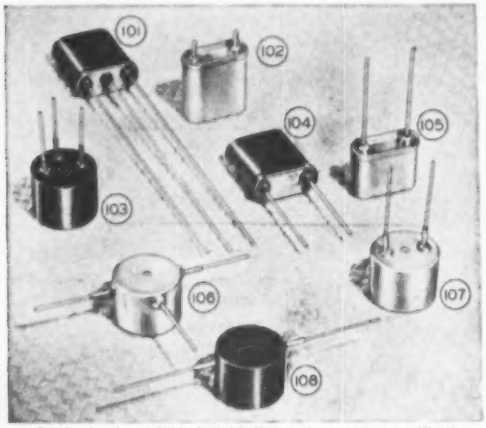

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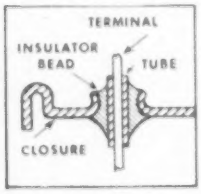

Stevens hermetically sealed thermostats—featuring an electrically independent bi-metal element that eliminates artificial cycling or life-shortening "jitters"—are available in disc types for controlling higher-wattage circuits, or in strip types for controlling low-wattage circuits or for use in conjunction with disc thermostats.

To insure the satisfactory performance of your product, specify Stevens hermetically sealed thermostats—*they perform better . . . last longer.* A-2914

*Stevens also makes a complete line of semi-sealed and standard bi-metal disc and strip thermostats. Write for data.

STEVENS *manufacturing company, inc.*
MANSFIELD, OHIO

pulse widths, it is mainly the thermal detector which has the major effect on the output, while for relatively large pulse widths the thermal detector drops out of the picture and the amplifier assumes the prominent role.

Ideally, the pulse width should be at least ten times the thermal detector time constant, and the amplifier time constant should be at least ten times larger than the pulse width. Under these conditions, the amplifier time constant would probably be so large that a d-c amplifier with its inherent problems would be required. It is for this reason that an amplifier time constant of ten times the thermal detector time constant (about 0.1 second for a 10-millisecond thermal detector) has been selected.

Cutoff Filter

To obtain a higher signal-to-noise ratio it is desirable to make the high-frequency cutoff as low as possible without seriously affecting the pulse amplitude or phase. Since the problem of calculating the response of a five-stage R-C amplifier which contains from one to four low-pass filters is extremely complex and since furthermore the high-frequency cutoff point can be made sufficiently high if necessary, to leave the signal pulse unaffected, this calculation was not performed. Instead, the effect of one low-pass filter on the thermal detector response alone is given to illustrate the effect of different high-frequency cutoff points and to enable a reasonable choice of low frequency filter to be made.

Figure 2C shows normalized curves of e_{out} vs time with μ as parameter, and is a plot of the response of the circuit in Fig. 1B. The pulse width was a constant ($\delta = 1$) at the lowest value giving reasonable output, in order to impose the severest restrictions on the low pass filter cutoff frequency. From the curves it is apparent that the larger μ is, the greater is the time lag. In fact, if μ is of the same order of magnitude as T (the thermal detector time constant), the phase lag would be prohibitive.

For all practical purposes, the pulse will be hardly affected in amplitude, shape or phase provided

This picture was taken in the Bridgeport office of The Southern New England Telephone Company, one of the 22 operating telephone companies which the Laboratories serve through the Bell System.

Cutting Board for Telephone Costs

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- **ALLOWS ELECTRICAL ISOLATION BETWEEN CIRCUITS**
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VICKERS Inc.
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μ is about 0.1. It should be borne in mind, however, that for several low-pass filters in cascade, the time lag will be correspondingly increased.

Conclusions

If a triangular radiation pulse is applied to a thermal detector and an associated five-stage R-C coupled amplifier, each stage having a time constant ten times greater than the thermal detector, usable outputs will be obtained provided the pulse width is 1 to 20 times the thermal detector time constant.

In addition, if a low-pass filter is included in the amplifier to increase the signal-to-noise ratio, its time constant should be a maximum of about one-tenth that of the thermal detector, otherwise additional phase lag will be introduced into the system.

SURVEY OF NEW TECHNIQUES

NONFERROUS strip materials like aluminum, brass, copper and stainless steel can be heat treated by induction heating because of a new development explained by Robert M. Baker of Westinghouse. The strip is passed between two opposing laminated pole structures. The field coils are so polarized that at any instant opposing poles have opposite sign and force flux through the strip. The technique, which is called transverse flux induction heating, was described in a paper before a recent meeting of the North Eastern District of the American Institute of Electrical Engineers.

TWO F-M SIGNALS can be simultaneously transmitted on the same frequency and separately received by a new technique called the bisignal system by its inventor, Raymond M. Wilmotte, consulting engineer of Washington, D. C. Instead of differentiating between signals by a frequency separation, as in the present f-m setup, Wilmotte provides two signals of different intensities and separates the signals, without crosstalk, in special receiving equipment.

One of a Series of Messages to the Buyer of Custom Molded Plastics

All Ways Alike!

"Statistical Quality Control" goes *Mrs. Pod* more-than-one better!

The original *Mrs. Pod*, unconcerned about specifications, delivers nature-molded pieces which, to the eye, need only *look alike* in appearance and size!

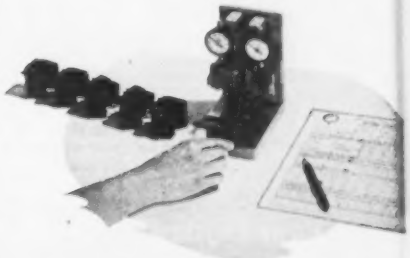
"Statistical Quality Control" goes much further. As a special production-improvement factor . . . and with the custom molder's press as its *pod*, each delivered part must fully comply with each and every required specification! Not only must parts look alike—they must be alike! . . . Size—shape—molding uniformity – precision placement of inserts – together with a multiplicity of inside and outside measurements . . . all, in *all* ways, must pass rigid tests before passing to the customer.

With "Statistical Quality Control" in force, few parts ever get the chance to develop an inferiority complex. The method raises the standard of an entire output and saves the customer the need and the cost of double inspections.

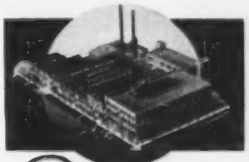
Whenever you are projecting a part – to be molded of plastic—and one that must toe the specifications line—call in a Consolidated sales engineer. Any one of our quickly reached offices is ready to apply experience, know-how and savings to your custom plastics problem.

Please address Dept. D-6

"STATISTICAL QUALITY CONTROL" *at Work!*



The system, one of scientific sampling, is documented by regular timings, gauge readings, jig constructions, graph plottings. In the hands of Consolidated's skilled plastics technicians, "S. Q. C." can't help but insure you the kind of plastics production that makes for a strong custom-molding relationship.



Consolidated *Molded Products Corporation*

***Plant & Executive Offices:* 309 CHERRY ST., SCRANTON 2, PA.**

Branch Offices and Representatives in* New York, Chicago, Detroit, Cleveland, Bridgeport, Philadelphia—*and other principal cities

CMP

A Million Dollars in Custom Molding Facilities to Guarantee "Your Blueprint in Plastic" . . . with Savings!

AVOID LOSSES FROM
"NICKING"
Not being an extruded plastic, absolute uniformity of diameter can be guaranteed. Therefore:—
NO NICKING OF CONDUCTORS
NO CONSTANT RESETTING OF BLADES

specify
CORNISH

"NOFLAME-COR"
the TELEVISION hookup wire

APPROVED BY UNDERWRITERS LABORATORIES AT 90° CENTIGRADE — 600 VOLTS

Proven BEST, and specified regularly, by leading manufacturers of television, F-M, quality radio and all exacting electronic equipment. For maximum output and minimum rejects. Available in all sizes, solid and stranded. Over 200 color combinations.

PRODUCTION ENGINEERS: Specify "NOFLAME-COR" for absolute uniformity of diameter, permitting clean stripping of insulation without damage to the copper conductor...

NO NICKING OF CONDUCTORS
NO CONSTANT RESETTING OF BLADES

AVOID LOSSES FROM
"BLOBBING"
Not being an extruded plastic, eliminates the costly "blobbing" of insulations under soldering heat

- Flame Resistant
- High Insulation Resistance
- Heat Resistant
- Facilitates Positive Soldering
- High Dielectric
- Easy Stripping
- Also unaffected by the heat of impregnation — therefore, ideal for coil and transformer leads

COMPLETE DATA AND SAMPLES ON REQUEST

"made by engineers for engineers"

CORNISH WIRE COMPANY, Inc.

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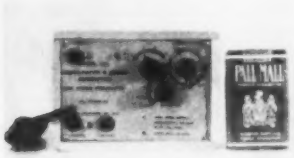
MANUFACTURERS OF QUALITY WIRES AND CABLES FOR THE ELECTRICAL AND ELECTRONIC INDUSTRIES

NEW PRODUCTS

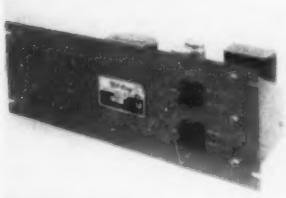
(continued from p 128)

and isolation transformer, is designed to speed up tv receiver service, minimize shock hazards, cut down service returns and prevent damage to shop test equipment. The primary winding has a line-voltage matching switch which is adjustable in 5-volt steps over the 105 to 130-v range. The instrument has two output circuits, a 275 volt-ampere isolation secondary and an autotransformer connection providing 500 volt-amperes.



Tele Test Set

OAK RIDGE PRODUCTS, 239 E. 127 St., New York 35, N. Y. Model 104 cross-hatch and sweep generator provides a new approach to the problem of servicing sync and sweep failures in a tv receiver. The unit consists of an r-f oscillator section which is calibrated on channels 2 to 5 and a modulator section with a specially designed switching network to provide a variety of frequencies. By turning the selector switch to different positions the serviceman can adjust sync and sweep of the receiver without a test pattern or program on the air.



Frequency Standard

BLILEY ELECTRIC CO., Erie, Pa., has announced a frequency standard employing a 100-kc crystal and featuring 24-hour frequency stability of two parts in 10 million when subjected to line voltage fluctuation of as much as 10 percent. Terminals

READ WHAT USERS SAY ABOUT G.E.'s New All-Purpose* Insulating Varnish G-E 9574

J. L. Hughes, owner of the J. L. Hughes Electric Company, Columbus, Ohio, says:

"We have found from test and practical experience that General Electric general-purpose varnish 9574 is tops for our work."

J. Lindborg, owner of AAA Electric Motor Service, Atlanta, Ga., says:

"Our experience has been that this varnish is as good as G.E. claims. It gives a good coat on every type of wire, bakes easily and dries to a tough coating that stands up perfectly in service."

Guy W. Probst, owner of Lockhaven Electric Repair Co., Lockhaven, Pa., says:

"I find that I only use about half as much 1201 Glyptal as a cover coat on 9574 as I had to use over the varnish I had been using, and I get higher gloss and better bonding."

These statements indicate the success of the new G-E 9574. If you are looking for an insulating varnish which bakes at low temperatures, penetrates deep coils easily, and requires no special thinner, investigate G-E 9574.

**G-E 9574 gives excellent results on all types of coils except extra-high-speed armatures. It is one of G.E.'s complete line of electrical insulating materials, including wedges, adhesives, cements, compounds, cords and twines, sleeving, wire enamels, mica, papers and fibers, permafils, tapes, tubing, varnished cloths, and varnishes.*

Here's A Bulletin You Should Have! If you haven't yet tried G-E 9574 get in touch with your local G-E Distributor, or write for our new bulletin to Section K3, Chemical Department, General Electric Company, Pittsfield, Massachusetts.

You, too, can put your confidence in

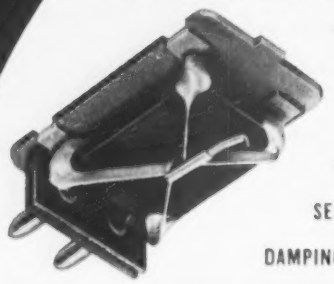
GENERAL ELECTRIC

only TORQUE E-V DRIVE gives you

everything you want

exactly as you want it!

- LOW-MASS DRIVING SYSTEM
- HIGH VOLTAGE COMPLIANCE PRODUCT
- MORE THAN ADEQUATE LATERAL COMPLIANCE
- FREQUENCY RESPONSE MATCHED TO YOUR OWN CURVE
- EXTRA MOISTURE PROTECTION AT NO EXTRA COST
- NO TEMPERATURE SENSITIVE PADS OR DAMPING MATERIALS
- NO BEARINGS OR BUSHINGS TO CAUSE FRICTION
- ZERO OUTPUT FOR VERTICAL MOTIONS
- HIGH VERTICAL COMPLIANCE



A Basic Specification in Original Equipment by Leading Manufacturers

Users of E-V TORQUE DRIVE* cartridges have long enjoyed these major advantages. Advanced design and performance characteristics have made them readily adaptable to all speeds and all requirements. This has made it easy to provide the right solution for each phono cartridge problem. Laboratory control assures consistent uniformity in quantity production. Available in single-stylus and dual-stylus types for 33⅓, 45 and 78 rpm single-speed or multi-speed record players. Let E-V engineers help you now. Our full facilities are at your service.

PHONO PICKUPS
MICROPHONES
SPEAKERS

Electro-Voice INC.

401 CARROLL STREET • BUCHANAN, MICHIGAN

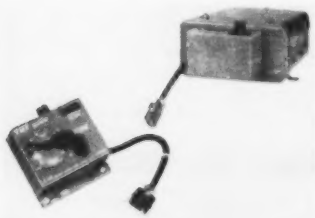
Export: 13 East 40th Street, New York 16, N. Y., U.S.A., Cables: Arlab

*E-V Pat. Pend. Licensed under Brush Patents

are provided for sine wave or harmonic output at both high and low impedance. Power supply is self-contained and the equipment is designed for rack or cabinet mounting. Complete technical literature is available.

Plug-In Hermetic Terminal

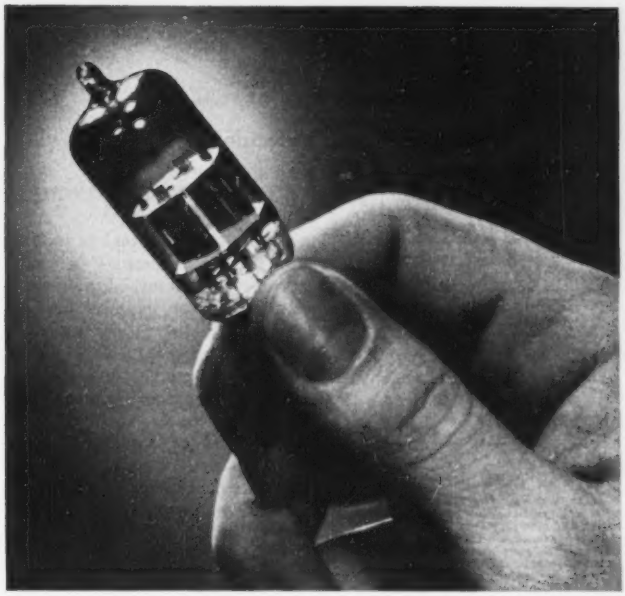
THE FUSITE CORP., Carthage at Hannaford, Cincinnati, Ohio, has introduced an octal-type-key plug-in terminal which incorporates tubular steel electrodes interfused with inorganic glass and plugs into a socket without external wiring. It offers 20 electrodes in a single metal disc and is especially suited for the hermetic sealing of relays. Standard sockets for the new terminal are available.



Remotely Controlled VHF Receiver

LEAR INC., AIRCRAFT RADIO DIV., 110 Ionia Ave., N. W., Grand Rapids 2, Mich. Model LR-5BR remotely controlled vhf receiver with small cockpit tuning control is available for aircraft owners requiring flexible mounting arrangements. The receiver weighs 3 lb 11 oz and measures 3½ in. × 6 7/16 in.,

Inside Information on the Inside of a Tube



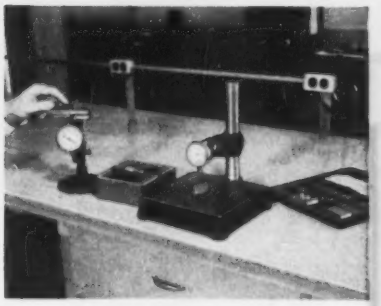
● The public-at-large does not know, as you do, that within nearly every electronic or television tube are other tubes. Or that these other tubes—of metal—can be as troublesome as they are tiny.

To see that they behave properly, the Electronics Division of Superior maintains excellent tubing research facilities, exercises tight control over production and product, helps you think your way out of problems in design and specification.

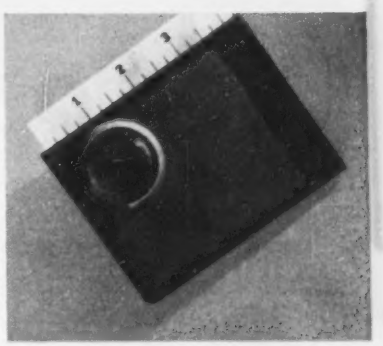
Superior was one of the early birds in electronics tubing—is always one of the first to come to your aid when you have tubing trouble . . . and is definitely a leader in tubing technology.

If you are one of the few electronic tube manufacturers who are not now enjoying all the help Superior can give you, get in touch with us today. Superior Tube Company, 2500 Germantown Avenue, Norristown, Pennsylvania.

Acid House Equipment where material is cleaned and rinsed before bright annealing.



Inspection and Gaging . . . equipment for checking dimensions of Seamless and Lockseam Cathodes.



52,600 Seamless Nickel Cathodes... standing on end compared with a ruler, and an ordinary pin under a lens.

Which Is The Better For Your Product . . .

SEAMLESS . . . ? The finest tubes that can be made. In all O.D.'s from 1⅝" and lower. Excellent for forming, bending, machining, etc., carbon, alloy, stainless, non-ferrous and glass sealing alloys.

Or LOCKSEAM* . . . ? Cathodes produced directly from nickel alloy strip stock by our patented machines. Available in a wide range of nickel alloys. Round, rectangular, or oval, cut to specified lengths, beaded or plain.

Superior

THE BIG NAME IN SMALL TUBING

All analyses .010" to ½" O.D.
Certain analyses (.035" max. wall) Up to 1⅛" O.D.

*REG. UNDER U. S. PATS. SUPERIOR TUBE COMPANY

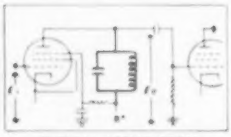
Electronic Products for export through Driver-Harris Company, Harrison, New Jersey • Harrison 6-4800

TOROIDAL COMPONENTS

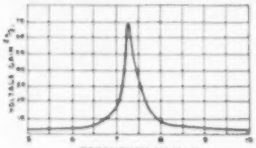
PRECISION TUNED CIRCUITS FOR YOUR SELECTIVE AMPLIFIER

ACTUAL SIZE

High Q precision tuned resonant circuits, accurately adjusted to your specified frequency. Toroid coil and capacitor are permanently protected by tough thermosetting plastic. Pigtail leads and light weight allow direct or terminal board mounting.

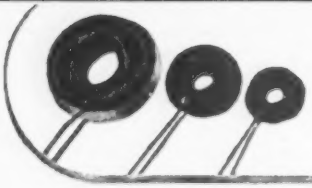


TYPICAL APPLICATION



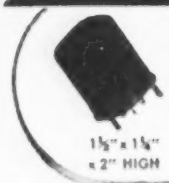
FREQUENCY IN K. C.

CUSTOM MADE TOROID COILS

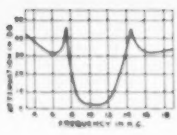


Toroid coils, transformers and discriminators in a large range of inductances, frequencies and power levels. Permalloy dust cores. Uncased, mounted in hermetically sealed cans or coated with thermosetting plastic. Close tolerances with taps at any point. Multiple windings. Up to 2 Henries on wedding ring size. Larger sizes to 50 Henries.

MINIATURE TOROID FILTERS



1½" x 1⅝" x 2" HIGH



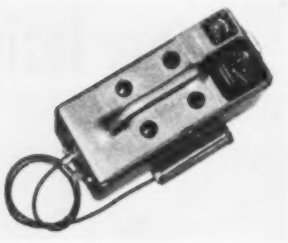
Specialized design and complete production facilities for your filter requirements. Where space is critical, miniature filters with wedding ring toroids and special capacitors. Supplied in standard units, or designed to your specification. A miniature band pass filter and curve are shown.

RAPID PRODUCTION DELIVERY. Engineering requirements given special attention. Wire, phone or write complete specifications.

COMMUNICATION ACCESSORIES Company

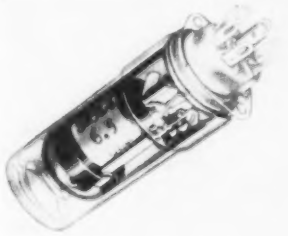
HICKMAN MILLS, MISSOURI

× 10 27/32 in.; the tuning control weighs 6 oz and measures 1 7/8 in. × 3 29/32 in. × 3 1/32 in.



Portable Scaler

BERKELEY SCIENTIFIC CO., Richmond, Calif. Model 80 portable, battery-operated scaler is specifically designed to meet the need for accurate determinations of radioactive levels in locations where conventional power supplies are not available or where line transients make conventional scalers unreliable. The instrument consists of a G-M tube and probe, a scale-of-eight electronic counter, a mechanical register and an adjustable, high-voltage battery supply. It has a maximum continuous counting rate of 14,400 counts per minute and will resolve individual pulses at 90 microseconds.



Subminiature Relays

POTTER & BRUMFIELD MFG. CO., INC., Princeton, Ind. Series SM subminiature relays are constructed so as to permit use with miniature socket and shield with inner spring. They can be made for use in guided missiles, aircraft applications and many general uses. The relays are offered with coil power ratings up to 1.75 watts and with d-c windings

Here's why this Diffusion Pump Sets the Pace

in Cathode Ray Plants

HIGHER SPEEDS mean better tubes. Note these speeds—consider what they can mean in profits for you.

30 liters/ sec. at 10^{-5} mm.
70 liters/ sec. at 10^{-4} mm.
75 liters/ sec. at 10^{-5} mm.
48 liters/ sec. at 10^{-6} mm.

HIGHER FOREPRESSURE TOLERANCE reduces mechanical pump maintenance. Down-time of mechanical pumps is far less in a year . . . productive operating periods longer. Mechanical pumps need not be at high efficiency.

High Vacuum Pressures	Maximum Forepressure
10^{-4} mm.	0.300 mm.
10^{-5} mm.	0.275 mm.
10^{-6} mm.	0.260 mm.
10^{-7} mm.	0.225 mm.

QUICKER COOLING eliminates troublesome valves. *With only 2 minutes cooling* you can open this pump to atmospheric pressure. No need to tie up valuable equipment during long cooling periods . . . no need to pay for expensive valves and their maintenance.

IMMEDIATE SHIPMENT! For your convenience, adequate stocks of standard National Research Corporation pumps are kept on hand at all times. We can make immediate shipment as required.

SPECIAL MODELS are no problem. We gladly fabricate many specials to suit the requirements of different plant designs . . . in a variety of flanges, foreline lengths, etc.

Added together these advantages have quickly made this National Research diffusion pump first choice of the cathode ray industry. If high vacuum is a problem in your plant or laboratory, you will find it will pay to investigate. Write today.

INDUSTRIAL RESEARCH · PROCESS DEVELOPMENT
HIGH VACUUM ENGINEERING AND EQUIPMENT

METALLURGY · DEHYDRATION · DISTILLATION
COATING · APPLIED PHYSICS

New, Low Cost DIFFUSION PUMP FLUID NARCOIL 20 Write for Details!

National Research Corporation

Seventy Memorial Drive, Cambridge, Massachusetts

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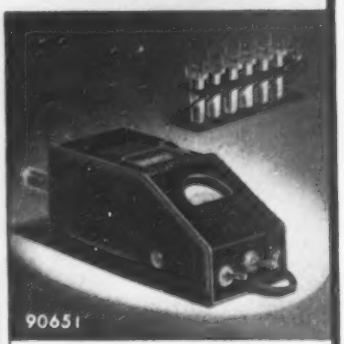
Designed for

Application



The No. 90651

GRID DIP METER

The No. 90651 MILLEN GRIP DIP METER is compact and completely self contained. The AC power supply is of the "transformer" type. The drum dial has seven calibrated uniform length scales from 1.5 MC to 300 MC plus an arbitrary scale for use with the 4 additional inductors available to extend the range to 220 kc. Internal terminal strip permits battery operation for antenna measurement.

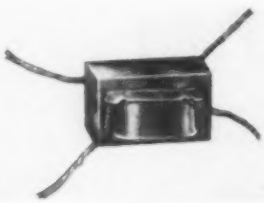
JAMES MILLEN MFG. CO., INC.

MAIN OFFICE AND FACTORY

MALDEN

MASSACHUSETTS

from 0.155 to 8,000 ohms. With minimum adjustment they pull in on 3 ma at 75 mw. Ask for bulletin 102.



Tiny Auto Transformer

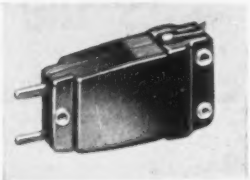
UNITED TRANSFORMER CO., 150 Varick St., New York 13, N. Y. Type SSO standard audio transformer measures 0.4 × 0.75 × 0.56 in., and weighs 0.28 oz. Especially suitable for hearing aid, aircraft and all other applications where size and weight are the prime consideration, the transformer is ideal for the military's miniaturization program. Designs are available for all types of low-level applications requiring wide frequency range. All are vacuum impregnated for dependable operation under high humidity conditions.

Pulse Rise Time Indicator

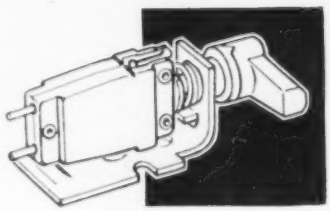
ELECTRONIC SYSTEMS CO., 555 E. Tremont Ave., New York 57, N. Y. Model 632-B pulse rise time indicator is an instrument for the accurate plotting of the rise time of rapidly rising positive voltage pulses. It employs a specially designed delay line of variable length and a vtvm. Controls include an on-off switch, zero set and sensitivity selector, speed and direction

Webster Electric

Model "A" Cartridge



with Twist Mechanism



A complete unit with top performance and absolute minimum of service and installation problems.

The twist mechanism is factory assembled with Model A7 cartridge in place, ready for installation in tone arms without adjustment or modification. This completely assembled unit gives positive tracking at all playing speeds. High vertical and lateral compliance eliminate "skating". The simple, foolproof twist mechanism gives positive indexing, eliminating the possibility of twisting and damaging the leads in the tone arm.

There are no delicate parts to break or get out of order. The Model A7 with twist mechanism reverses through a 180 degree arc for playing either 33⅓ — 45 or 78 R.P.M. records.

Send for a sample assembly today... try it ... then note first hand the advanced improvement.

WEBSTER ELECTRIC

Webster Electric Company, Racine, Wis. • Established 1909

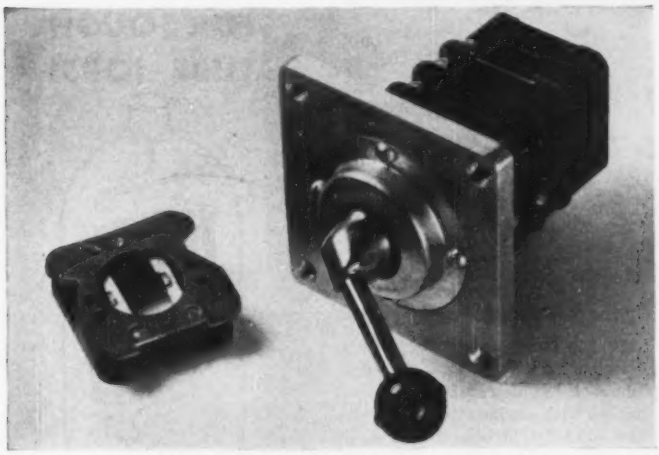
"Where Quality is a Responsibility and Fair Dealing an Obligation"

COPPER ALLOY BULLETIN

PRODUCT IMPROVEMENT EDITION

REPORTING NEWS AND TECHNICAL DEVELOPMENTS OF COPPER AND COPPER-BASE ALLOYS

Prepared Each Month by Bridgeport Brass Co. "Bridgeport" *Headquarters for BRASS, BRONZE and COPPER*



Push-Pull-Selector switch and section showing copper contact bars. Courtesy The Arrow-Hart & Hegeman Electric Co., Hartford, Conn.

Copper, Brass Used for Parts in Push-Pull Selector Switch

Each copper-base alloy has individual characteristics such as electrical conductivity, strength and workability. The design engineer first selects his material from the standpoint of the job to be done by each part. Then, when given a choice, he selects the alloy which may be worked or machined more readily.

A good example of this type of product designing is seen in the rotating cam sections of the Push-Pull-Selector switch control manufactured by the Arrow-Hart & Hegeman Electric Company, Hartford, Conn. A small, compact unit, this switch provides a single point of control for multi-operation machines.

Electrical Conductivity Solved

Copper, due to its high conductivity and low resistivity, was used in various tempers for all the main pole, current carrying sections such as the movable and stationary contact members. High electrical capacity was thereby allowed in minimum spaces.

The external shunt employed for tieing the poles together, however, is of high brass (65% copper, 35% zinc), due to its lower cost and the fact that it is an external part where heat dissipation was not a problem. The central driving tube and several assembly eyelet bushings are also this alloy because of its greater machinability and strength.

Brass for Low-current Parts

In the low current circuit section, the brass plates to which the contact buttons are attached is also of yellow brass. This material has greater electrical resistance than copper and the silver contact buttons are attached more readily by resistance welding.

Silver butt type contacts are also resistance welded to the copper plates in the high-current sections.

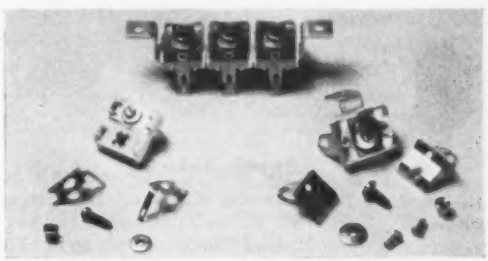
Four Copper-Base Alloys Used in Small Condensers

Many types of copper-base alloys are used for making padder and trimmer condensers for electronic equipment.

In the illustrated condensers, the threaded bushings which take the adjusting screw are screw machine parts of medium-leaded brass rod (63% copper, 1.8% lead and remainder zinc). This alloy has a lower lead content than the free-machining rod. Machinability is reduced slightly, but it is more ductile, permitting staking of the bushing into the shell.

The thin plates in both types of condenser, blanked from strip, are of yellow brass rolled to a spring temper. However, the top compression plates are of spring temper phosphor bronze. This alloy has excellent fatigue resistance, needed in these units due to continual adjustment.

For the eyelets which are swedged over to hold the plates in place, cartridge brass (70% copper, 30% zinc) is utilized for its high ductility and good drawing characteristics. All the parts are tinned to facilitate soldering.



Padder condenser is shown on left and trimmer condenser and parts on right. Ganging, as shown at top right, may include any number of individual condensers. Courtesy Electro Motive Manufacturing Co., Willimantic, Conn.

The dielectric spacers are of pure mica and the shell, or base, is also of a dielectric material.

Capacity is increased when the dielectric space is decreased. Since adjustment is exceptionally fine, the brass bushing provides a smooth-operating bearing surface with the steel adjusting screw.

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INDIANAPOLIS, INDIANA
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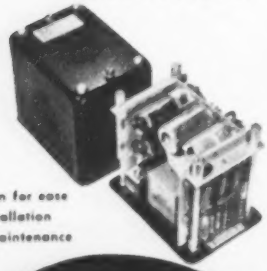
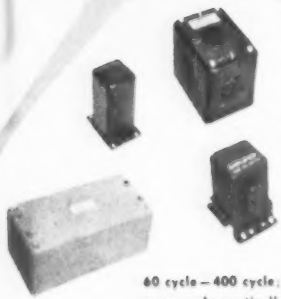
Functional Electronics

SERVO
amplifiers
A MECHA PRODUCT



Plug-in for ease of installation and maintenance

Servomechanisms, Inc. offers a group of functionally packaged Servo Amplifiers and companion Power Supplies designed to fulfill every need in the control and instrument field, providing the system designer with a facility of proven dependability and maximum performance.



60 cycle — 400 cycle; open or hermetically sealed construction

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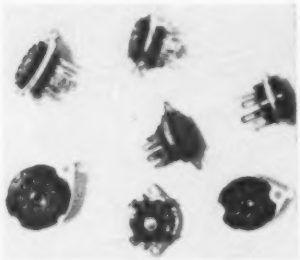
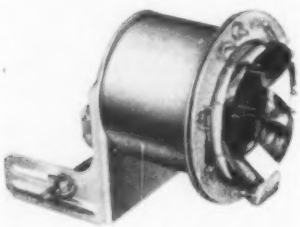
controls for varying the length of line, and an indicator denoting delay of line. Rise time is 0.005 μsec to 0.1 μsec in 20 steps. It is also available in other ranges.



Radio Receiving Tube Sockets

SYLVANIA ELECTRIC PRODUCTS, INC., Warren, Pa. The radio receiving tube sockets illustrated are designed for use with a wide range of miniature and GT-type tube circuit applications. Socket types include T5½, T6½ and octal with 7, 8 and 9 cadmium-plated brass contacts; general-purpose low-loss shielded or unshielded phenolic bases; with or without center shield, and with or without ground lugs on cadmium-plated or hot-tin-finish saddle, for top or bottom chassis mounting.



Sweep Yoke

GENERAL ELECTRIC CO., Syracuse, N. Y., has announced a new sweep yoke designed to sweep up to 70-deg picture tubes with high efficiency. When the yoke is used in conjunction with associated sweep components the horizontal sweep system requires only 20 watts of horizontal input from a 250-volt supply. Horizontal inductance is 18 millihenrys, and vertical inductance, 30 milli-

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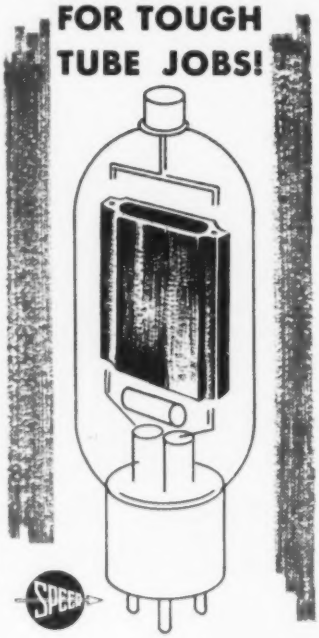
GRAPHITE ANODES
FOR TOUGH
TUBE JOBS!



Speer's graphite anodes were especially developed to meet the severest demands of modern equipment for superior tubes that would withstand extreme shock and distortion under impact. Rugged, long-lasting and dependable, graphite anode tubes offer such Speer plus values as:

. . . *Higher Ratings*—200-300% higher power rating over most metallic anodes.

. . . *Greater Tube Stability*—Because graphite won't warp, maintains its characteristics, warping of other tube elements is eliminated.

. . . *Longer Life*—Thanks to their lower operating temperatures, graphite anode tubes successfully withstand severest usage.

The demonstrated superiority of graphite anode tubes has made them "must" equipment for short wave and FM transmitters, diathermy, oscilators, modulators, rectifiers and similar equipment. For maximum efficiency under *all* conditions, *look for the tube with the graphite anode.*

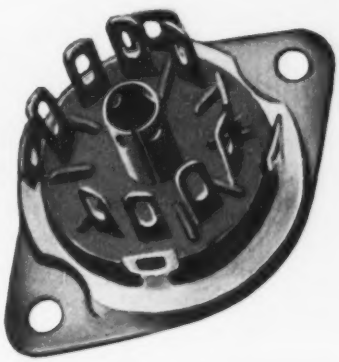
6477

Speer CARBON COMPANY ST. MARYS, PENNA.

For Extremely Low Insulation Loss Factor

MYCALEX

9-Pin and 7-Pin Miniature **Tube Sockets** and Subminiature Sockets



Enlargement of the new 9 (NOVAL) pin miniature tube socket.

Above: Complete 9 pin miniature socket.
Below: Precision moldings in MYCALEX actual size two views.

We recently made news by the addition of a 9 pin (NOVAL) miniature tube socket to the MYCALEX line. It has all the electrical characteristics of the widely used MYCALEX 410 and 410 X 7 pin tube sockets and fully meets RMA standards.

The NOVAL is injection molded and produced in two qualities to satisfy different requirements.

MYCALEX 410 for applications requiring close dimensional tolerances. Insulation loss factor of .015 (at 1 MC) yet compares favorably in price with mica filled phenolics.

MYCALEX 410X for applications where general purpose bakelite was acceptable but with an insulation loss factor of only .083 (at 1 MC). Prices compare with lowest quality insulation materials.

Write us today and let us quote you prices on your particular requirements. We will send you samples and complete data sheets by return mail. Our engineers are at your disposal and would be glad to consult with you on your design problems.

Mycalex Tube Socket Corporation

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PRECISION
RECORDING WITH THE
Variplotter

The Model 205 Variplotter, highlighting accuracy, speed, and versatility, brings to industry and laboratory a new tool with a wide field of application. This instrument will present on a 30-inch square plotting surface a precise graphic representation of one variable as a function of another variable, requiring only that the variables be expressed by d-c voltages.

ACCURACY The static accuracy is .05 percent of full scale at 70°F. The dynamic accuracy averages .05 percent of full scale plus the static accuracy at a writing speed of 8½ inches per second.

SENSITIVITY The standard sensitivity of the Variplotter is fifty millivolts per inch with other ranges of sensitivity available.

RESPONSE The maximum pen and arm accelerations are 350 and 150 inches per second squared, respectively. Slewing speeds of both pen and arm are 10 inches per second.

The Variplotter may be adapted for special use by the addition of accessories selected from our standard line—such as multiple variable conversion kits, low-drift d-c amplifiers, analog computer components, or components designed for your specific need.

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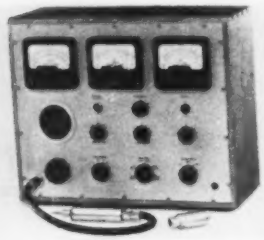
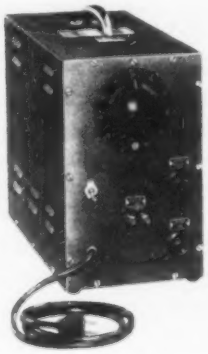
LONG BRANCH NEW JERSEY

henrys. It is available with either a laminated, or for higher efficiency, a Ferrite core.



Heterodyne Voltmeter

BRUAL & KJAER, Naerum, Denmark. Type 2002 beat-frequency voltmeter is a selective tube voltmeter for the measurement of a-c voltages in the h-f range. It is specially designed for use in laboratories for measurements on radio receivers, radar i-f circuits, control of signal generators and coax carrier-frequency systems. Frequency range is from 20 kc to 27 mc. Voltage range is from 10 μv to 10 v. Accuracy is better than ± 0.5 db. A specification sheet is available.



Regulated Voltage Supply

SOLA ELECTRIC CO., 4633 W. 16th St., Chicago 50, Ill. Type CVL Solavolt is a precision source of regulated voltage with minimum harmonic distortion, designed for use with equipment requiring an adjustable source of constant a-c voltage (from 0 to 130 volts) of undistorted wave shape. Regulation is ±1.0 percent for line input changes from 95 to 125 v with less than 3-

This may be the solution to your D. C. AMPLIFICATION problems

MICROSEN
D. C. AMPLIFIER

Simple in operation, the Microsen D. C. Amplifier is designed to meet the need for stable and accurate amplification. It is compact to provide easy portability and convenient general use, is moderate in cost. The amplifier has many applications in both laboratory and field work. Three different ranges are furnished in a single model. The Microsen Balance, an electro mechanical feedback amplifier, combines the advantages of high torque to current input ratio with rugged, shock-resistant construction. Available models include Voltage, Current and Potentiometer Type Amplifiers, Direct Current Converters, Direct Current Transformers, and Engineered Designs to meet special requirements.

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Field of Measurement	Input Element	Output Instrument	Application	Design Advantages
Thermometry	Thermocouple	Recorder	Combustion Research Gas Turbine Development Thermocouple Inspection Meteorology Distillation Processes	High Speed Response Accuracy Sensitivity Stability
Photometry	Photo Cell	Recorder	Polarimetry Physiology of Blood Fluid Flow & Turbulence Density	Stability Sensitivity Responsive Accuracy
Gas Analysis	Catalytic Filament Thermocouple	Recorder	Detecting Explosive Mixture Efficiency of Filters Mixture Control	Sensitivity Stability Accuracy High Speed Response
Electrical Bridges	Resistors Resistance Elements	Recorder	Resistor Inspection Moisture Detection Conductivity Measurements	Sensitivity Stability Accuracy Fast Response
	Pirani Gauge		Vacuum Gauging	Stability
	Strain Gauge		Transient Stresses	Accuracy
Electronics	Inductance Ionization Thermionic	Recorder	Wave Guide Studies Vacuum Gauging Tube Development	Sensitivity Stability Low Resistance Input
Electrolysis	Electrolytic Cells Current Shunt	Recorder	Production Control Electrolytic Plating Electrolytic Process	Isolated Input Stability Accuracy

In each of the above applications, the Recorder could be replaced with a suitable milliammeter indicator, or the output can be used to actuate automatic control relays or signal devices. Inquiries for modification within the useful scope of the Microsen D. C. Amplifier are invited. If possible, such inquiries should contain complete application specifications.

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A PRODUCT OF
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Makers of 'Microsen' Electrical and 'American' Industrial Instruments, 'Hancock' Valves, 'Ashcroft' Gauges, 'Consolidated' Safety and Relief Valves. Builders of 'Shaw-Box' Cranes, 'Budgit' and 'Load Lifter' Hoists and other lifting specialties.

Manning, Maxwell & Moore, Inc.
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We are interested in your Microsen D. C. Amplifier. Please send the bulletin describing the instrument to the following address:

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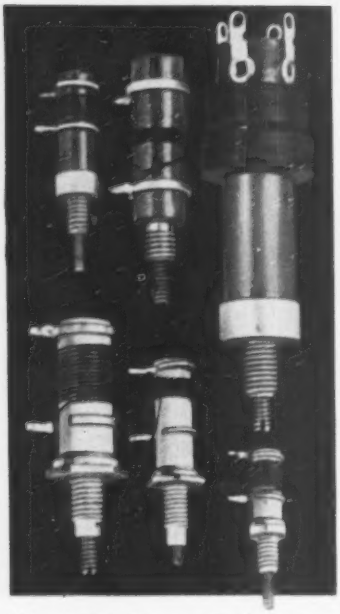
Street Address_____
City_____ State_____



Which Of These Coil Forms Best Fits YOUR Needs?

Coil Forms Only, Or Coils Wound To Your Specifications . . . Cambridge Thermionic will furnish slug tuned coil forms alone or wound with either single layer or pie type windings to fit your needs, in high, medium or low frequencies . . . and in small or large production quantities.

See table below for physical specifications of coil forms.

SEND COMPLETE SPECIFICATIONS FOR SPECIALLY WOUND COILS

Coil Form	Material	Mounting Stud Thread Size	Form O.D.	Mounted O.A. Height
L51	L-5 Ceramic	8-32	1/4"	11/16"
L56	L-5 Ceramic	10-32*	1/4"	7/8"
L53	L-5 Ceramic	1/4-28*	3/8"	1 1/16"
L5M	Paper Phenolic	8-32	1/4"	7/8"
L53	Paper Phenolic	1/4-28	3/8"	1 1/16"
L541	Paper Phenolic	1/4-28	1/2"	2"

*These types only provided with spring locks for slugs. †Fixed lugs. All others have adjustable ring terminals. All ceramic forms are silicone impregnated. Mounting studs of all forms are cadmium plated.

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437 Concord Ave., Cambridge 38, Mass.
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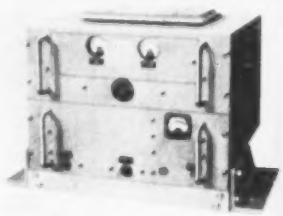
percent harmonic distortion. Voltage regulation is automatic and maximum response time, 1.5 cycles. Write for technical bulletin CVL-140.

Nuclear Circular Slide Rule

NUCLEAR INSTRUMENT & CHEMICAL CORP., 229 W. Erie St., Chicago 10, Ill., has announced the Nuclearule, a new type of slide rule, which makes it possible to obtain quickly count rate, statistical error, coincidence loss, activity of sample versus half life, radiation flux after passage through absorbers, and other data. These values are obtained by simple settings of the rule.



VHF Transmitter

PLESSEY INTERNATIONAL LTD., Ilford, Essex, England. Designed originally to meet airport local control requirements, the type PT.10 twelve-watt vhf transmitter has a wide field of application wherever a compact fixed-station transmitter with an r-f power output of this order is required. The complete equipment consists of a modulator and an r-f unit, available either desk or rack mounted. Covering the 118 to 132-mc band the crystal-controlled operational frequency can be varied by insertion of the appropriate crystal. Bandpass circuits in the r-f unit minimize the neces-

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can rely on

Cramer

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QUALITY
ACCURACY

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Synchronous motor driven. Register automatically and cumulatively total operating or idle time on circuits, machines, systems.

TIME DELAY RELAYS
Provide adjustable or fixed time delay between operation of a control circuit and subsequent opening or closing of a load circuit.

SYNCHRONOUS MOTORS
Permanent magnet type for applications requiring a constant speed at a given frequency. Small size. 30" ounce torque. Twenty-eight speeds from 60 rpm to 1/24 rph.

For a wide range of standard timers and controls . . or special adaptations for specific applications . consult **R. W. CRAMER CO.**, Box No. 3, Centerbrook, Conn.

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SUPERSPEED
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Sets new standards of performance, utility and economy for TV station operation. Provides a means of film pickup that approaches the contrast and clarity characteristic of studio productions.
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Used with a Du Mont Special Image-Orthicon film pickup to give studio clarity to movies and teletranscriptions.
BACKGROUND PROJECTOR
Brings dramatic moving sets and backgrounds into any studio. Eliminates costly and cumbersome sets and backdrops.
For information on the Superspeed Projector or other Du Mont Telecasting Equipment write, phone, or visit.
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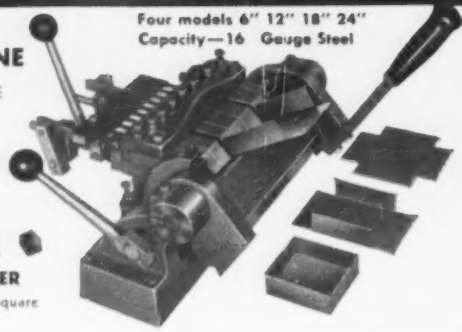
New! di-acro BOX FINGER BRAKE

Four models 6" 12" 18" 24"
Capacity—16 Gauge Steel

3 TOOLS IN ONE

1. BOX and PAN BRAKE
2. STANDARD BRAKE
3. BAR FOLDER



OPEN END FINGER
for forming triangular, square and rectangular tubes.

Versatility from the word GO!! One box or 10,000—can be economically produced with the new Di-Acro Box Finger Brake. The complete box finger bar also serves perfectly for all standard brake operations. An Acute Angle Bar—quickly mounted—converts the brake to a bar folder for locks, seams, hems and sharp angles. The unique Di-Acro Open End Finger forms square or triangular tubes and other similar parts difficult to make. Real machine tool construction, with hardened and precision ground box fingers, assures permanent accuracy in producing duplicated parts. The Box Finger Bar can be easily mounted on all standard Di-Acro Brakes.

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DI-ACRO Shears, Punches, Benders, Brakes, Notchers and Rod Parters,—also Power Shears and Benders.

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THERMOSTATIC METAL TYPE
Delay Relays

PROVIDE DELAYS RANGING FROM 1 TO 120 SECONDS

FEATURES: — Compensated for ambient temperature changes from —40° to 110° F . . . Hermetically sealed; not affected by altitude, moisture or other climate changes . . . Explosion-proof . . . Octal radio base . . . Compact, light, rugged, inexpensive . . . Circuits available: SPST Normally Open; SPST Normally Closed.

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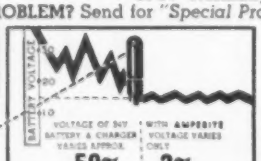
Regulators

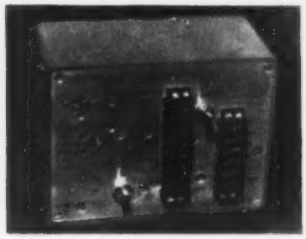


Amperite **REGULATORS** are the simplest, lightest, cheapest, and most compact method of obtaining current or voltage regulation . . . For currents of .060 to 6 Amps. . . . Hermetically sealed; not affected by altitude, ambient temperature, humidity.

Write for 4-page Illustrated Bulletin.

AMPERITE CO., Inc., 561 Broadway, New York 12, N. Y.
In Canada: Atlas Radio Corp. Ltd., 560 King St. W. Toronto

sary tuning controls and a preset circuit in the modulator unit automatically prevents over-modulation.



Balance Amplifier

SCHAEVITZ ENGINEERING, Camden 11, N. J. Type 60AD-1 balance amplifier for use with linear variable differential transformers has been announced. The instrument enables the lvdt to regulate the power of a motor. It senses the phase condition and magnitude of the lvdt output, amplifies the information and supplies power to operate the motor in the correct direction. The amplifier can operate two phase induction motors rated up to 25 watts, at full power in either direction of rotation in accordance with signals corresponding to a lvdt core motion of as little as 0.0001 inch. It is powered directly from the 117-v, 60-cycle, a-c line.

Spectrum Analyzers

POLYTECHNIC RESEARCH AND DEVELOPMENT CO., INC., 202 Tillary St., Brooklyn 1, N. Y. A series of microwave spectrum analyzers permits accurate determination of r-f pulse characteristics. Each unit consists of a type 850 power supply, i-f and video unit, together with a demountable r-f unit appropriate

The RCA "TV Duo"...

Designed for the Professional Television Technician

The new WR-59B Television Sweep Generator *for all TV channels and having continuous IF and video coverage from 0.3 to 50 Mc.*

The new WR-39B Television Calibrator *is a Linearity Pattern Generator.*

Matched in design... unmatched anywhere for their advanced engineering features... these new companion units furnish *all basic signals* essential for the rapid, precision servicing and production testing of television receivers. Flexibility, versatility, and accuracy are outstanding characteristics of each unit individually and in combination.

The RCA WR-59B Television Sweep Generator covers all broadcast television channels on preset selector-switch positions, and in addition features a continuous tuning range from 0.3 to 50 Mc, to accommodate current and future intermediate frequencies. The rf signal is frequency-modulated at the fundamental frequency by a precision-type vibrating capacitor of advanced design. The signal is free from spurious responses and other frequency components often found in harmonic generators and beat-frequency oscillators.

An additional feature of the WR-59B is the inclusion of a blanking circuit which produces a zero-reference line on the cathode-ray tube. This base line aids in determining the amplitude of the signal. The base line is also very useful in aligning FM discriminator circuits, or in checking the exact slope of the frequency-response curve of any circuit.

The RCA-39B Television Calibrator features crystal calibrated markers for all TV frequencies and is useful in making linearity adjustments. Included in this one instrument is a crystal-calibrated variable-frequency oscillator, two crystal-controlled oscillator stages with three crystals supplied, a wide-band modulator stage for internally modulating the output at audio and radio frequencies, and an audio amplifier with speaker. The instrument provides a crystal-controlled 4.5-Mc output for alignment of TV sets employing intercarrier sound... crystal-controlled markers 4.5 megacycles removed from the main marker, for television rf and if alignment ...and crystal-controlled markers 250 kilocycles removed from the main marker, for sound discriminator alignment.

Additional features are – provision for injection of external marker... internal audio and rf modulation of variable-frequency oscillator... and crystal-calibrated heterodyne frequency meter.

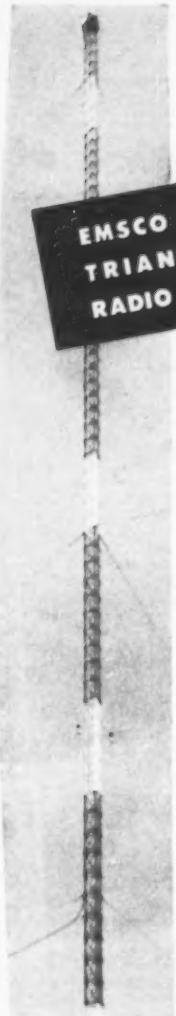
For a complete and modern television alignment setup, your best buy is the WR-39B Television Calibrator combined with the WR-59B Television Sweep Generator and the new, revolutionary WO-57A Oscilloscope matching unit. This "TV Trio" is also available in the WS-17A 3-unit rack.

For complete details on the WR-39B and WR-59B, see your RCA Test Equipment Distributor, or write RCA, Commercial Engineering, Section F42Y, Harrison, N. J.

Available from your RCA Test Equipment Distributor

RADIO CORPORATION of AMERICA

TEST EQUIPMENT **HARRISON, N. J.**



EMSCO GUYED TRIANGULAR RADIO TOWERS

FOR AM, FM, UHF, VHF, MICROWAVE, TELEVISION AND RADAR

Emsco guyed triangular radio towers are engineered for high wind load capacity, low maintenance costs and perfect transmission pattern . . . for *all* types of communication . . . in *all* industries. Standard towers available with 20½", 3', 5' or 14' faces, heights to 1000 feet and to withstand 20, 30 or 40 pound wind loads.

FREE BULLETIN

New Emsco Bulletin F-173 gives complete information on Emsco guyed triangular radio towers and Emsco free-standing square and triangular towers. Write for your free copy today!

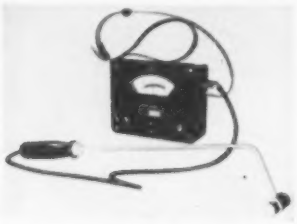
EMSCO TOWERS OF STRENGTH

EMSCO DERRICK & EQUIPMENT COMPANY

Houston, Texas
LOS ANGELES, CALIFORNIA
Garland, Texas

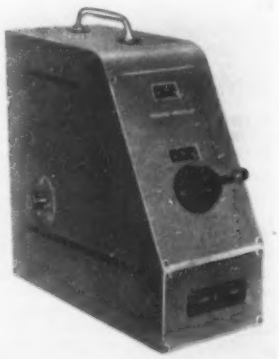
Shown here is an Emsco 20½-inch face, 160-foot Type IRT Emsco radio tower with 30-pound wind load rating.

for the particular frequency range of interest. Available units now covered the S-band and X-band regions of the microwave spectrum, with a special combination instrument, type 855, containing r-f units for both ranges.



Tin-Content Indicator

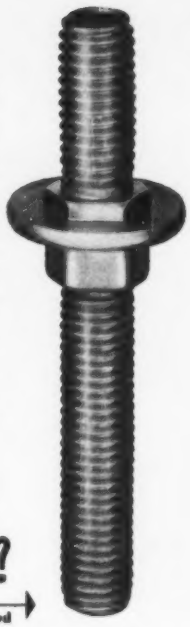
WHEELCO INSTRUMENTS CO., Chicago 7, Ill., has released a new portable direct-reading indicator for the determination of the ratio of lead and tin content in solder. It consists essentially of a high-resistance pyrometer and a convenient plug-in type sensing unit. Up to 7-percent tin content of lead alloys may be tested in a matter of seconds, thus eliminating time-consuming laboratory tests.



UHF Frequency Meter

POLYTECHNIC RESEARCH & DEVELOPMENT CO., INC., 202 Tillary St., Brooklyn 1, N. Y. Type 584 tunable frequency meter permits accurate measurement of r-f signals throughout the new uhf television band. Dials are calibrated to read directly in mc. A coaxial-type cavity resonator is employed in which

how would you have this copper stud made?



Transformer stud shown actual size

This transformer stud was made in *one* piece by cold heading at a much lower cost than would be possible by any other method. Cold working of the metal also produces a stronger part.

Perhaps the cold heading process, in the hands of Scovill's engineers, toolmakers and operators, can help *you* get better parts at lower cost. Send your sample or blueprint for further information.

"Guide to the Profitable Use of Cold Heading" — Bulletin No. 2 describes the advantages and limitations of this process for the designer. It's free for the asking.

Recessed Head Screws • Semi Tapping Screws • Standard Machine Screws • Special Cold Headed Parts

SCOVILL

SCOVILL FASTENERS AND SPECIAL PARTS

Industrial Fastener Sales, Waterville Division
Scovill Manufacturing Co., Waterville 14, Conn.

New York • Detroit • Wheaton, Ill.
Los Angeles • Cleveland • San Francisco

Superior's New Model TV-20 — A COMBINATION 20,000 OHMS PER VOLT MULTI-METER

TELEVISION KILOVOLTMETER

ADDED FEATURE
Includes an Ultra High Frequency Voltmeter Probe with a frequency range up to 1,000 MEGACYCLES. When plugged into the Model TV-20, the V. H. Probe converts the unit into a Negative Peak-Reading H. F. Voltmeter.

The Model TV-20 operates on self-contained batteries. Comes housed in beautiful hand-rubbed oak cabinet complete with portable cover, Built-In High Voltage Probe, H. F. Probe, Test Leads and all operating instructions.

9 D. C. VOLTAGE RANGES: (At 20,000 ohms per Volt) 0-2.5/10/50/100/250/500/1,000/5,000/50,000 Volts

8 A. C. VOLTAGE RANGES: (At 1,000 ohms per Volt) 0-2.5/10/50/100/250/500/1,000/5,000 Volts

5 D. C. CURRENT RANGES: 0-50 Microamperes 0-5/50/500 Milliamperes 0-5 Amperes.

4 RESISTANCE RANGES: 0-2,000/20,000 ohms. 0-2, 20 Megohms.

7 D. B. RANGES: (All D. B. ranges based on 6DB = 1 Mw. into a 600 ohm line)
— 4 to + 16 db
+ 8 to + 22 db
+ 22 to + 36 db
+ 28 to + 42 db
+ 36 to + 50 db
+ 42 to + 56 db
+ 48 to + 62 db

7 OUTPUT VOLTAGE RANGES: 0 to 2.5/10/50/100/250/500/1,000 Volts

$39.95 NET

Superior's NEW MODEL TV-10

TUBE TESTER

The Model TV-10 operates on 105-130 Volt 60 cycles A.C. Comes housed in a beautiful hand-rubbed oak cabinet complete with portable cover.

$39.50 NET

SPECIFICATIONS:

Tests all tubes including 4, 5, 6, 7, Octal, Lock-in, Peanut, Bantam, Hearing-aid, Thyratron, Miniatures, Sub-Miniatures, Novals, etc. Will also test Pilot Lights.

Tests by the well-established emission method for tube quality, directly read on the scale of the meter.

Tests for "shorts" and "leakages" up to 3 Megohms.

Uses the new self-cleaning Lever Action Switches for individual element testing. Because all elements are numbered according to pin-number in the RMA base numbering system, the user can instantly identify which element is under test. Tubes having tapped filaments and tubes with filaments terminating in more than one pin are truly tested with the Model TV-10 as any of the pins may be placed in the neutral position when necessary.

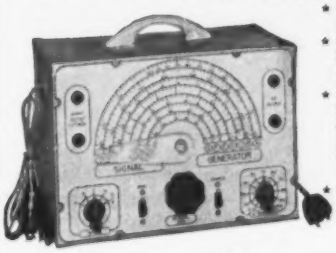
The Model TV-10 does not use any combination type sockets. Instead individual sockets are used for each type of tube. Thus it is impossible to damage a tube by inserting it in the wrong socket.

Free-moving built-in roll chart provides complete data for all tubes.

Newly designed Line Voltage Control compensates for variation of any line voltage between 105 Volts and 130 Volts.

The New Model 200 AM and FM

SIGNAL GENERATOR



★ R.F. FREQUENCY RANGES: 100 Kilocycles to 150 Megacycles.

★ MODULATING FREQUENCY: 400 Cycles. May be used for modulating the R.F. signal. Also available separately.

★ ATTENUATION: The constant impedance attenuator is isolated from the oscillating circuit by the buffer tube. Output impedance of this model is only 100 ohms. This low impedance reduces losses in the output cable.

★ OSCILLATORY CIRCUIT: Hartley oscillator with cathode follower buffer tube. Frequency stability is assured by modulating the buffer tube.

★ ACCURACY: Use of high-Q permeability tuned coils adjusted against 1/10 of 1% standards assures an accuracy of 1% on all ranges from 100 Kilocycles to 10 Megacycles and an accuracy of 2% on the higher frequencies.

★ TUBES USED: 12AU7 - One section is used as oscillator and the second is modulated cathode follower. T-2 is used as modulator. 6C4 is used as rectifier.

The Model 200 operates on 110 Volts A.C. Comes complete with output cable and operating instructions.

$18.85 NET

Superior's New Model TV-30 — TELEVISION SIGNAL GENERATOR

Model TV-30 comes complete with shielded co-axial lead and all operating instructions.

$29.95 NET

Enables alignment of television I. F. and FRONT ENDS without the use of an oscilloscope.

SPECIFICATIONS

Frequency Range: 4 Bands—No switching
18— 32 Mc.
35— 65 Mc.
54— 98 Mc.
150—250 Mc.

Audio Modulating Frequency: 400 cycles (Sine Wave)
Attenuator: 4 position, ladder type with constant impedance control for fine adjustment.

Tubes Used:
6C4 as Cathode follower and modulated buffer.
6C4 as R.F. Oscillator.
6SN7 as Audio Oscillator and power rectifier.

SUPERIOR'S NEW MODEL 670

SUPER METER

A Combination VOLT-OHM-MILLIAMMETER plus CAPACITY REACTANCE, INDUCTANCE and DECIBEL MEASUREMENTS.

D.C. VOLTS: 0 to 7.5/15/75/150/750/1500/7500 Volts. A.C. VOLTS: 0 to 15/30/150/300/1500/3000 Volts. OUTPUT VOLTS: 0 to 15/30/150/300/1500/3000 Volts.

D.C. CURRENT: 0 to 1.5/15/150 ma. 0 to 1.5 Amps. RESISTANCE: 0 to 500/100,000 ohms, 0 to 10 Megohms. CAPACITY: .001 to .2 Mfd., .1 to 4 Mfd. (Quality test for electrolytics.) REACTANCE: 700 to 27,000 Ohms; 13,000 Ohms to 5 Megohms.

INDUCTANCE: 1.75 to 70 Henries, 35 to 8,000 Henries.

DECIBELS: -10 to +15, +10 to +38, +30 to +58.

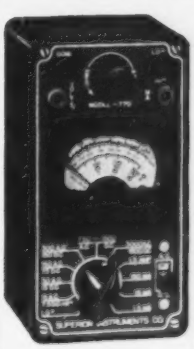
The model 670 comes housed in a rugged, crackle-finished steel cabinet complete with test leads and operating instructions. Size 5½" x 7½" x 3".

$28.40 NET

SUPERIOR'S NEW MODEL 770 — An Accurate Pocket Size

VOLT-OHM MILLIAMMETER

(Sensitivity: 1000 ohms per volt)



Features:
Compact, measures 3½" x 5⅞" x 2¼". Uses latest design 2% accurate 1 Ma D'Arsonval type meter. Same zero adjustment holds for both resistance ranges. It is not necessary to readjust when switching from one resistance range to another. This is an important time-saving feature never before included in a V.O.M. in this price range. Housed in round-cornered, molded case. Beautiful black etched panel. Depressed letters filled with permanent white, insures long life even with constant use.

Specifications: 6 A.C. VOLTAGE RANGES. 0-15/30/150/300/1500/3000 volts.

6 D.C. VOLTAGE RANGES: 0-7½/15/75/150/750/1500 volts.

4 D.C. CURRENT RANGES: 0-1½/15/150 Ma. 0-1½ Amps.

2 RESISTANCE RANGES: 0-500 ohms. 0-1 Megohm.

The Model 770 comes complete with self-contained batteries, test leads and all operating instructions.

$13.90 NET

GENERAL ELECTRONIC DISTRIBUTING CO. Dept. EL-6, 98 Park Place, New York 7, N. Y.

Another First!

. . . in radiation instrumentation

VICTOREEN introduces . . . a new 100r hi-intensity pocket ionization chamber.

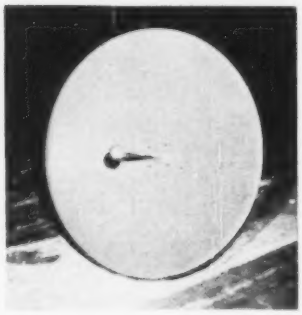
The new Victoreen Model 506 pocket ionization chamber is designed to meet the need for a compact dependable chamber for measurement of radiation in the 100 r range.

Many new features make the 506 unique for measuring hi-intensities. This pocket chamber fulfills basic requirements as it incorporates accurate measurement even with short exposure time—affords a wide energy response from 40 KV and up—offers high dosage with overdosage not affecting its performance and, equally important, the chamber is tamper-proof and cannot be discharged except by using the Model 392 Minometer Charger.

The 506 hi-intensity chamber is shorter than the conventional pocket size and fits an aluminum shell $\frac{1}{2}$" in diameter and $3\frac{3}{4}$" overall. It is further identified by color coding the clip end.

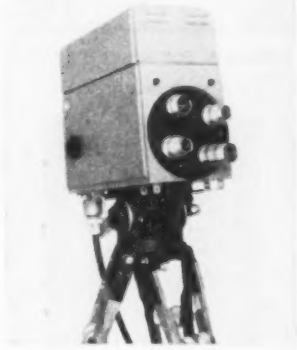
THE VICTOREEN INSTRUMENT CO.
5806 HOUGH AVE., CLEVELAND 3, OHIO

the center conductor is adjusted by rotation of the frequency dial so as to vary the resonant frequency continuously from 470 to 950 mc.



Parabolic Antennas

THE WORKSHOP ASSOCIATES, INC., Crescent Road, Needham Heights, Mass. Five new parabolic antennas cover the 5,929 to 7,125-mc frequency band. Each is available in two, four, six and eight-ft diameters, and mounts can be had for all types of installations. The antennas have gains up to 44.9 db and can be supplied with complete deicing equipment and junction boxes. Write for the descriptive booklet.



Field TV Camera Chain

POLARAD ELECTRONICS CORP., 100 Metropolitan Ave., Brooklyn 11, N. Y. Model CV-2 lightweight versatile field television camera chain incorporates the latest design image orthicon pickup tube, type 5820, which enables it to be used

PRECISION ATTENUATION to 3000 mc!

*Patents applied for

- VSWR less than 1.2 at all frequencies to 3000 mc.
- **Turret Attenuator*** featuring **"Pull — Turn — Push"** action with 0, 10, 20, 30, 40, 50 DB steps.
- Accuracy ± .5 DB, no correction charts necessary.
- 50 ohm coaxial circuit. Type N connectors.

Inquiries are invited concerning single pads and turrets having other characteristics

STODDART AIRCRAFT RADIO CO.
6644 SANTA MONICA BLVD., HOLLYWOOD 38, CALIFORNIA
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ELECTRIC HEATING UNITS

Coils of Heat

Tubular Electric Heating Units that fit around or clamp to vessels, tanks, pipes, etc., for contact heating of metals, oils, air and water. . . . especially where little space is available and considerable heat is needed.

Can be bent into almost any shape.

STANDARD SIZES
or made to your requirements.

VULCAN ELECTRIC CO.
DANVERS 10, MASS.

Makers of Vulcan Electric Soldering Tools, Electric Solder Pots, Electric Glue Pots, Electric Branding Irons and Electric Heating Units, including the new Vulcan 900 series, for changing over any hot water heater to electric operation.

Only with CO-AX

air-spaced articulated
R.F. CABLES

THE LOWEST EVER CAPACITANCE OR ATTENUATION

We are specially organized to handle direct enquiries from overseas and can give

IMMEDIATE DELIVERIES FOR U.S.A.

LOW ATTEN TYPES	IMPED OHMS	ATTEN db/100ft at 100 Mc/s	LOADING ft at 100 Mc/s	O.D"	
A 1	74	1.7	0.11	0.36	HIGH POWER FLEXIBLE
A 2	74	1.3	0.24	0.44	
A 34	73	0.6	1.5	0.88	
LOW CAPAC TYPES	**CAPAC mmf/ft**	**IMPED OHMS**	**ATTEN db/100ft 100Mc/s**	**O.D"**	
C 1	7.3	150	2.5	0.36	PHOTOCELL CABLE
PC 1	10.2	132	3.1	0.36	
C 11	6.3	173	3.2	0.36	
C 2	6.3	171	2.15	0.44	
C 22	5.5	184	2.8	0.44	
C 3	5.4	197	1.9	0.64	
C 33	4.8	220	2.4	0.64	V.L.C. ★
C 44	4.1	252	2.1	1.03	

★ Very Low Capacitance cable

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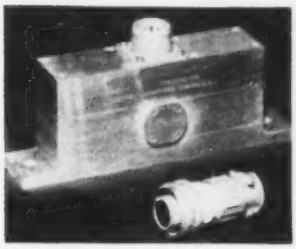
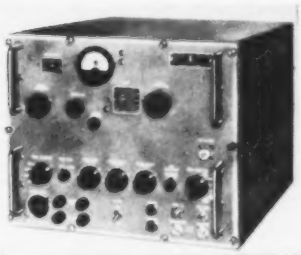
readily under conditions of poor illumination as well as in bright sunlight. The electronic viewfinder unit plugs in and clamps to the camera unit.



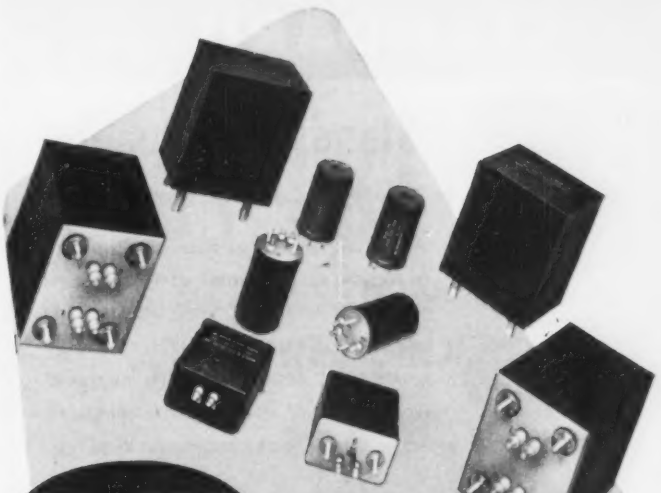
Angular Accelerometer

SCHAEVITZ ENGINEERING, Crescent Blvd. at Drexel Ave., Camden 11, N. J. Type W accelerometer, an application of the linear variable differential transformer, measures the angular acceleration of any body to which it is fastened. The sensitive element consists of a torsionally-suspended beam spring loaded at each end, with the lvdt core mounted on the beam. This torsionally-suspended mass is displaced angularly with respect to the instrument case when the latter is subjected to angular accelerations. The instrument is available in one of three natural frequencies, 6, 12, or 18 cps for the ranges of ±5, ±10 and ±30 radians per sec per sec respectively.



Microwave Signal Generators

POLYTECHNIC RESEARCH AND DEVELOPMENT CO., INC., 202 Tillary St., Brooklyn 1, N. Y. Types 902 and 903 broadband signal generators cover in two units the frequency range from 3,650 to 10,900



B&W Filter Manufacts*

- HIGH-PASS FILTERS
- LOW-PASS FILTERS
- BAND-PASS FILTERS
- BAND SUPPRESSION OR REJECTION FILTERS

For RF or audio filtering and line RF suppression . . . for harmonic attenuation and teletype communications . . . for single side band and telemetering equipment—these and many more are the uses to which B & W Filters are being applied daily. Time-tested and performance-proved, each of the filters listed above offers you a combination of accuracy and ruggedness that can't be beat in commercial equipment, military equipment . . . ANY EQUIPMENT.

That's why if your equipment requires filters—real filters built for day-in day-out dependability—B & W is the perfect answer. For details, write today to Barker & Williamson, Dept. EL-60.

*Manufacts = Manufacturing facts

BARKER & WILLIAMSON, INC.
237 Fairfield Avenue Upper Darby, Penna.

STANDARD...

Stands for Quality

Low Frequency Crystal Units

A special process has been developed to overcome fragility and give sturdiness to this STANDARD unit. Range—200 to 1200 kc. CT and DT cut. Hermetically sealed and filled with dry nitrogen. Good stability over wide temperature range. Meets government specifications. Write or wire for additional information.

We are in a position to make prompt delivery.

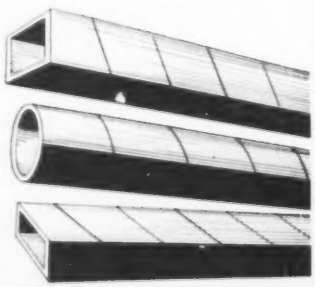
Standard Piezo Company
CARLISLE, PA.

How PRECISION PAPER TUBES protect your coil windings . . .

How far do these characteristics of your COIL BASES affect coil quality?

Every engineer knows the answer. Precision coil bases have long proved their reliability in these factors—with light weight and space saving. Made to your specifications of finest dielectric Kraft, Fish Paper, Cellulose Acetate or combinations. Any length, any ID or OD, round, oval, square, rectangular. Ask for new Mandrel list, over 1000 sizes.

Send for sample and LOW PRICES.

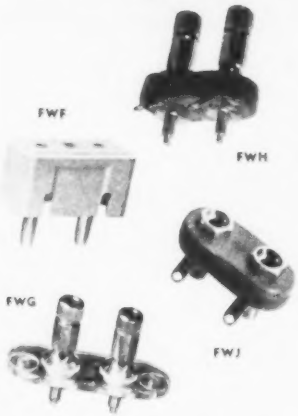


PRECISION PAPER TUBE CO.

2041 W. Charleston St., Chicago 47, Ill.
Plant No. Two, 79 Chapel St., Hartford, Conn.

NATIONAL

- Proven
- Dependable
- Quality



DELUXE TERMINALS

FWG. Polystyrene terminal strip for high frequency use. Binding posts take banana plugs at top, grip wires thru hole at bottom. Net 60¢

FWH. Molded mica bakelite insulators with serrated bosses grip thinnest panel firmly. Binding posts, same as FWG. Net 66¢

FWJ. Same insulators as FWH but with jacks. When used with FWF plug no metal is exposed. Net 54¢

FWF. Banana plugs in molded mica bakelite. Fits FWG, FWH, FWJ. Leads may be connected thru top or side. Excellent for 300-ohm twin lead. Net 70¢

National deluxe insulators and fittings are available for a wide range of uses.

Address export inquiries to Dept. E-650

National
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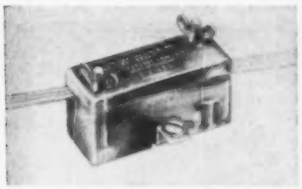
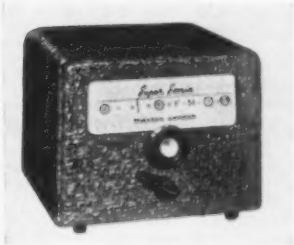
MALDEN, MASSACHUSETTS

mc. Each employs a tunable coaxial cavity oscillator incorporating a Raytheon type 5721 klystron. Resonant frequency of the oscillator is controlled by a front panel dial reading directly in frequency. Provision is made for c-w, f-m and pulse operation as well as for external modulation.



Lightning Arrester

THE LAPOINTE-PLASCOMOLD CORP., Unionville, Conn. Model RW 204 lightning arrester is designed for use with the four-wire control cable employed with antenna rotators. It is meant to serve dual purposes in that it may also be used for standard 300-ohm ribbon transmission line. Pin-point contacts in its polystyrene case eliminate the need for wire stripping and installation is accomplished by simply tightening down the cover with two wing nuts.



TV/F-M Amplifier

SONIC INDUSTRIES, INC., 221 W. 17th St., New York, N. Y. Model 1T4 amplifier is designed to provide high-gain preselection for any tv or f-m receiver, with adequate bandwidth to pass all desired modulating elements and yet with adequate selectivity to reject unwanted off-carrier signals and noise. Balanced input and output circuits provide for minimum noise pickup. Versatility in application has been

AN IMMEDIATE SENSATION!

CONCERTONE

PROFESSIONAL TAPE RECORDER

Plays up to 10½" NAB REELS

Complete for console installation, with dual track heads: $295.00

■ Never before in the history of tape recording has there been an instrument to equal the CONCERTONE. Its performance and specifications are beyond the $1000 class, yet its price is little more than that of mass-produced "novelty" recorders. Unbelievable? Yes . . . until you see and hear it. Write us today for a descriptive booklet. After you have read it, we know that like ourselves you will not rest until there is a CONCERTONE in your home or office. The supply is limited. Better not delay.

Outstanding Features of the CONCERTONE

• Broadcast studio quality; complies with latest NAB standards. • Plays 5", 7" *as well as* 10½" NAB reels. (With 10½" reels: 33 min. at 15"/sec., 66 min. at 7½"/sec.) • Separate heads for erase, record and playback. All heads prealigned and quickly interchangeable for single or dual track. • Instantaneous choice of 7.5" or 15" tape speeds; automatic equalization for speed selected. • High speed forward and reverse—2500 feet in 60 seconds. • Three dynamically balanced motors. • Flutter: less than 0.1% at 15" and 0.2% at 7.5". • Frequency range 30-15,000 cycles: (2 db from 40-12,500 cycles at 15"/sec.; 2 db from 40-7500 cycles at 7.5" per second.) • Signal-to-noise ratio: better than 50 db. • Total harmonic distortion: less than 2% at normal maximum signal level. • Recording level indicator. • Simultaneous monitoring from the tape while recording. • All controls interlocked to protect tape. • Available, at additional cost, with base shown, console, or carrying case. *Size:* 14" x 22" x 7¾" high

Exclusive Eastern Distributor

FISHER RADIO CORPORATION · 37 E. 47th ST., NEW YORK

READY TO STAKE CUT SWAGE CRIMP RIVET MARK

ELECTROPUNCH

A LIGHTNING-FAST ELECTRIC IMPACT HAMMER

A Production Tool with 1000 Uses

- Low priced
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BLACK & WEBSTER, INC.

306 PLEASANT STREET, NEEDHAM 92, MASS.

NATURAL TREBLE

kettle drum SPEAKERS by BOZAK

TRUE TYMPANY BASS

For *On-stage Realism* of tone, the Bozak "Kettle Drum" loudspeaker is unmatched in price, unsurpassed in listening pleasure. Critical listeners—those interested in complete musical enjoyment, in recording, broadcast monitoring or speech training—agree that the "Kettle Drum" adds new dimensions to high fidelity sound reproduction.

Years of electronic and acoustical research have combined to develop these unprecedented features:

- Bozak "Kettle Drum" 32" spun steel baffle for true pitch bass
- Bozak 12" free-moving cone woofer for outstanding, low resonance bass response
- Bozak damped-cone dual tweeter for distinctly natural treble and broad, smooth response

Response: 40—15,000 cycles with useful response to 16,000; Input: 12 watts, peaks to 18 watts; Impedance: 8 ohms; Coverage: 120° at 10 kc; Woofer magnet: 22 oz. Alnico V

For all applications demanding highest quality sound reproduction at moderate power levels, hear the Bozak "Kettle Drum", model B-201 (patents pending) at your dealer's, or write

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R. T. BOZAK CO.

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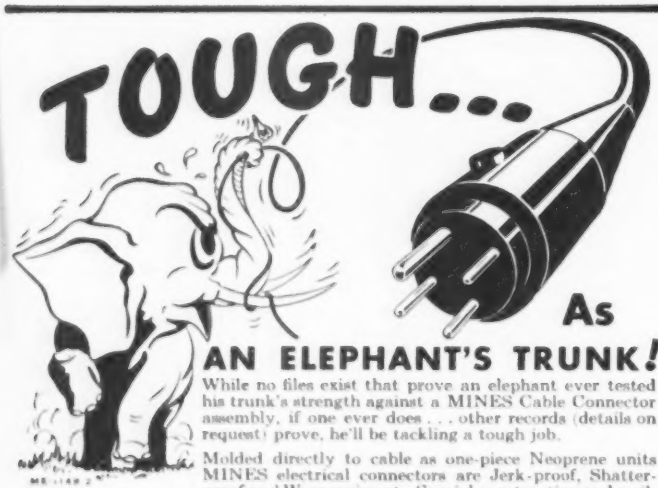
TOUGH...



As AN ELEPHANT'S TRUNK!

While no files exist that prove an elephant ever tested his trunk's strength against a MINES Cable Connector assembly, if one ever does . . . other records (details on request) prove, he'll be tackling a tough job.

Molded directly to cable as one-piece Neoprene units MINES electrical connectors are Jerk-proof, Shatterproof and Wear-resistant—Special construction and resilient rubber mounting of pins and spring loaded sockets insure a long life of low contact resistance — and the famous MINES Water-Seal automatically protects connections from dirt, oil or water.

A wide variety of sizes, shapes and pin combinations are available to meet the portable power requirements of TV, FM, AM or PA Circuits. No. 4A093 Male plug illus.

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provided for by both 72-ohm and 300-ohm input and output matching impedances.

Tiny Pressure Pickup

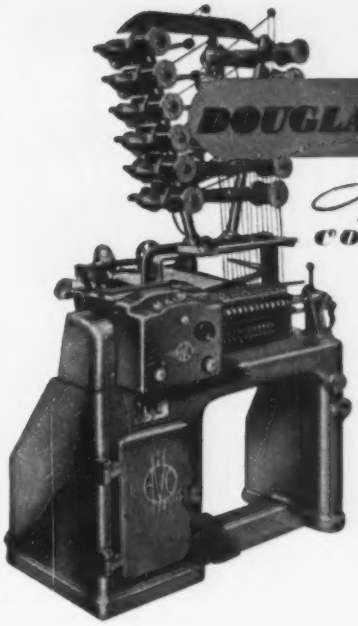
BENDIX AVIATION CORP., Pacific Division, 11600 Sherman Way, North Hollywood, Calif. The new subminiature pressure pickup with a range from 0 to 400 psi is designed for use in the AN/DKT-3 or other f-m/f-m telemetering systems. Natural frequency is 500 to 2,000 cps with the response time dependent upon the length and diameter of the connecting tubing. Acceleration error is negligible. Weight is 0.32 lb.

Recording-Tape Splicer

RASON MFG. CO., 61 Myrtle Ave., Brooklyn, N. Y. The Jiffy Splice is a precision tool for splicing of recording tape with minimum waste. Operation consists in placing the two ends under the clamps overlapping about $\frac{1}{4}$ in. and cutting in the diagonal groove with razor blade or knife. Then one places Scotch tape over the cut and trims by cutting in horizontal grooves.

Literature

Universal Impedance Bridge. Brown Electro-Measurement Corp., 4635 S. E. Hawthorne Blvd., Portland 15, Oregon, announces a four-page bulletin on the model 250-B universal impedance bridge for



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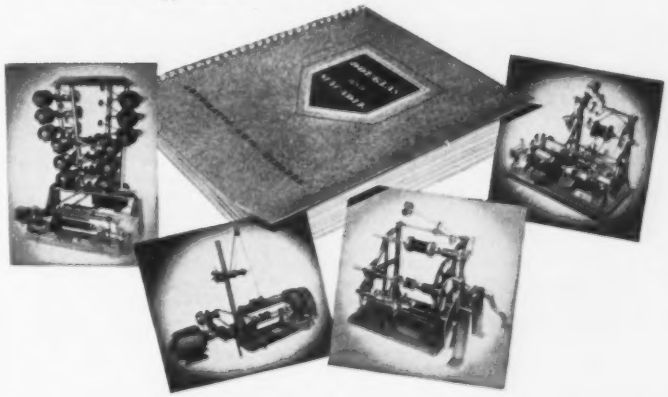
THE large illustration depicts the improved "Douglas" Fully Automatic Multi-Winder, specially developed for the high-speed production of large quantities of coils with or without paper interleaving. It will produce round, square or rectangular coils up to 6 inches each in length and up to 4½ inches diameter. As many as twelve smaller coils can be wound simultaneously within the total available winding length of 12 inches at headstock speeds of between 600 and 2,000 revolutions per minute.

Numerous other Coil Winding and Taping Machines are illustrated in our complete Catalogue, a copy of which will be sent to interested executives on application.



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Cables: "Autowinda, Sowest, London." *Code: A.B.C. 5th. Edn.*

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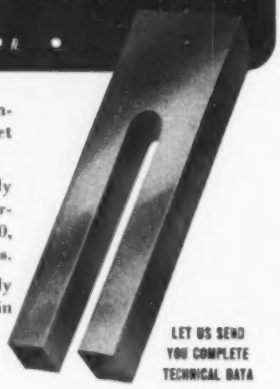
Temperature-compensated and hermetically sealed, the resonators are available in accuracies from 1 part in 3,000 to 1 part in 100,000, for operation over wide temperature ranges.

The resonators may be obtained individually—as a part of compact sub-assemblies—or in completely engineered equipment.



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measuring resistance, capacitance and inductance. Illustrations, applications, chief features and specifications of the unit described are included. Range of the instrument treated is as follows: resistance—1 milliohm to 11 megohms; capacitance—1 $\mu\mu$f to 1,100 μf; inductance—1 μh to 1,100 henrys.

Resistor Bulletin. Hardwick-Hindle Inc., Newark 5, N. J. Bulletin 350 describes the construction (ceramic core, uniformly-wound resistance wire and corrosion-resistant terminals) and coating (blue-gray vitreous enamel) of a line of resistors. Illustrations, technical data and information on ordering are given.

Rectangular TV Bulbs. American Structural Products Co., Box 1035, Toledo 1, Ohio, offers a booklet of scale details to enable television tube and set manufacturers to take full advantage of the all-glass television bulbs. The 12-page book contains scale drawings showing all dimensions of the rectangular bulbs in 14, 16 and 19-in. sizes, and round bulbs in 12½, 16 and 19-in. sizes. It illustrates the advantages of rectangular bulbs over round bulbs by comparisons of area, shape and completeness of picture.

VHF Signal Generator. Hewlett-Packard Co., 395 Page Mill Rd., Palo Alto, Calif. Volume 1, No. 7 of the Journal is an article on the model 608A vhf signal generator which covers the range from 10 to 500 mc. The four-page folder includes a complete description with photographs, diagrams and a table of specifications.

Radioactivity Instruments. Tracerlab Inc., 130 High St., Boston 10, Mass. Catalog B is a 92-page booklet covering a variety of radioactivity measuring and handling instruments. Units illustrated and described include: scalers, scaler accessories, preamplifier and tube accessories, counting-rate and survey meters, G-M tubes, general

3 New JOHNSON Sampling Loops

Now available, three newly designed models of JOHNSON Phase Sampling Loops covering all broadcasting sampling requirements and at sharply reduced prices.

For installations requiring high sensitivity and extreme stability, the 173-10 adjustable shielded loop (illustrated) is recommended. For less exacting applications and where economy is a major consideration, the new 173-11-1 and 173-11-2 unshielded loops are ideal.

The 173-10 shielded loop responds only to the magnetic field and provides high accuracy phase sampling, unaffected by weather conditions. The loop consists of two enamelled copper conductors securely supported and insulated from the 3" copper electrostatic shield tubing. Dimensions are: height 6 feet, width 2 feet. Heavy duty insulators support the loop which may be rotated and locked in position. Entry for the sampling line is provided in the bottom pivot shaft.

The unshielded loops offer an economical means of sampling tower currents where the use of the more sensitive electrostatically shielded loop is not warranted. The 173-11-2 is an insulated, adjustable single turn loop. The 173-11-1 loop is grounded to the tower and the tower member serves as the fourth side of the loop. Sensitivity is adjusted by varying the distance between the tower leg and the outer side of the loop. Construction is of heavily plated steel tubing and all necessary hardware for mounting and bonding is furnished. Broadcast net prices of JOHNSON Sampling Loops are:

173-10	$65.00
173-11-1	30.00
173-11-2	40.00

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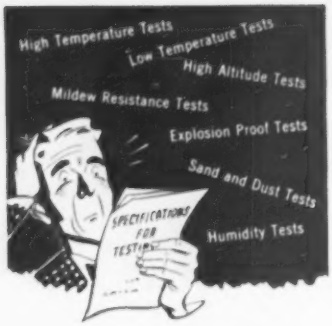

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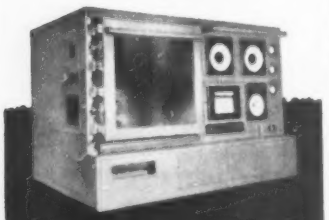

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equipment, lead shields, industrial instruments and dosage meters. Other topics treated are tagged chemicals, laboratory services, and procedure of service and repair.

Microwave Test Equipment. Polytechnic Research & Development Co., Inc., 202 Tillary St., Brooklyn 1, N. Y., has issued 19 loose-leaf catalog pages giving technical data and illustrations for its latest line of microwave test equipment. An attached instruction bulletin will enable holders of catalogs to bring them up to date. Also available are a table of contents and a price list.

Low-Loss Switches. Communication Products Co., Inc., Keyport, N. J. The looseleaf perforated bulletin 107 describes models 86 low-power, 88 medium-power and 90 high-voltage high-power switches. Supports for all the switches are low-loss impregnated steatite, and all current and voltage ratings indicated are for 60 cycles. Electrical data and dimensional drawings for each model are given.

Precision Potentiometer. Southwestern Industrial Electronic Co., 2831 Post Oak Road, Houston 19, Texas. Model P-2 precision electronic potentiometer for use on high-impedance electrochemical cells or electronic tubes and circuits is the subject of a recent four-page brochure. Included are essential features, block diagram, applications, specifications and prices.

Capacitor Bulletins. Glenco Corp., Durham Ave., Metuchen, N. J. A 14-page booklet enclosed in a looseleaf folder contains bulletins giving the dielectric constant vs temperature on capacitor bodies K-23, K-17, K-24, K-28, K-31, K-38 and K-45. Also included are dielectric constant and power factor vs temperature figures on capacitor bodies K-85, K-300, K-1500 and K-3300. For the latter two capacitor bodies are found information

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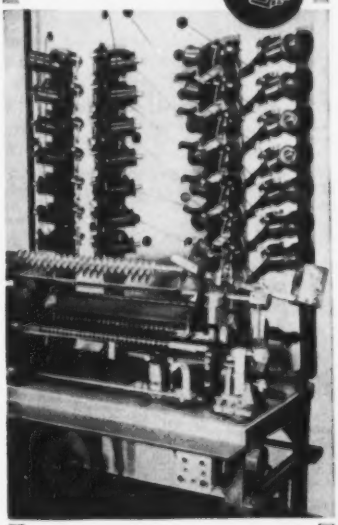

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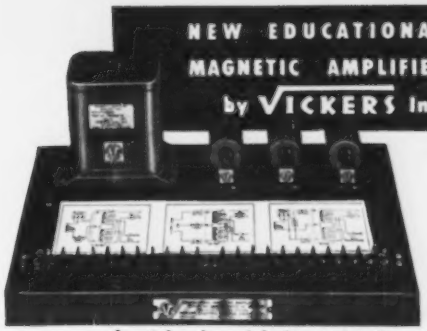

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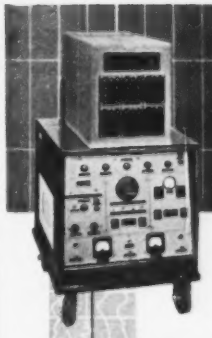

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The Hathaway SC-16A Six Element Recording Cathode-Ray Oscillograph, designed for recording fast transients and continuous phenomena, brings you new highs in resolution because of its unusually high frequency response and high chart speed. Note these unusual features:

FREQUENCY RESPONSE 0 to 200,000 cycles per second • RECORDS up to 1000 ft. long at speeds up to 600 inches per second • RECORDS up to 10 ft. long at speeds up to 6000 inches per second • WRITING SPEED above 100,000 inches per second • SIX ELEMENTS with interchangeable lens stages for 1, 2, 3, or 6 traces on full width of chart • INTERCHANGEABLE RECORD MAGAZINES for continuous recording or short records of fast transients • PRECISION TIMING tuning fork controlled QUICK-CHANGE TRANSMISSION for 16 record speeds • AUTOMATIC INTENSITY CONTROL • CONTINUOUS SWEEP OSCILLATOR

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Price $395.00 f.o.b.
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The TEKTRONIX **Type 105** *Square Wave Generator provides a suitable signal for both of the above tests. Its frequency range, extending continuously from 25 cycles to 1 mc., combined with its risetime of .02 microseconds, makes it possible to quickly and accurately test amplifiers, filters, etc., having pass bands from a few cycles to 20 mc.*

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on dielectric constant vs measuring voltage, dielectric constant vs applied d-c bias voltage and stabilization of room temperature capacity after heating above 120 C.

Marine Communications. Kaar Engineering Co., 2815 Middlefield Road, Palo Alto, Calif. An eight-page folder covers the model D-24 marine radio direction finder, the 100-watt series 96 medium-frequency radiotelephone, the series 19(20 w) and 46(50 w) marine, mobile and land station radiotelephone equipment, the series 25 radio receiving equipment and the ES-29, a 100-fathom echo depth sounder. Description, illustrations and specifications are given.

Beryllium-Copper Wrought Products. The Beryllium Corp., Reading, Pa. Bulletin 12, which describes alloy, condition and temper and includes tables of mill sizes and properties, will aid in specifying beryllium-copper strip. Data covered includes strip in thicknesses ranging from 0.002 to 0.187 in., inclusive. Similar data for beryllium-copper in rod, bar and wire forms will be found in bulletin 13.

Wired Television. Diamond Power Specialty Corp., Lancaster, Ohio, has available a 16-page bulletin on the Utiliscope wired television system. Descriptive and illustrated pages show the many applications of the system which enables seeing where looking is impossible. The system treated consists of a camera, power unit and monitor or viewing unit. The whole installation under discussion weighs only 121 pounds.

Induction Resolvers. Reeves Instrument Corp., 215 E. 91st St., New York 28, N. Y. Bulletin RICO-3 shows the theory and application of induction resolvers used to perform trigonometric operations in analog computing devices and control systems. Description, tabulated performance data, circuits and dimensional

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Here's a custom-built instrument that's typical of Fairchild's job-engineered solutions of difficult potentiometer problems. It's a 3-gang potentiometer with 17 taps per unit, giving 16 sections of equal resistance—8 each side of center. By using resistors of various sizes between taps, almost an infinite number of non-linear functions can be approximated. For control purposes, each unit can be used as a continuously varying switch to fire tubes such as Thyratrons in sequence.

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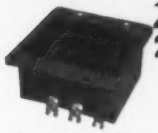

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Socket contacts phosphor bronze, knife-switch type, cadmium plated. Plug contacts hard brass, cadmium plated. 2, 4, 6, 8, 10, and 12 contacts. Plugs and sockets polarized. Long leakage path from terminal, and terminal to ground. Caps and brackets, steel parkerized (*rust-proofed*). Plug and socket blocks interchangeable in caps and brackets. Terminal connections most accessible. Cap insulated with canvas bakelite.

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meet all instrumentation needs

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HERMETIC SEALED TYPES
ALL TYPES OF MOUNTING

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drawings are included. Range of operating frequencies for the units described is from less than 60 to greater than 1,000 cps.

D-C Breaker Amplifier. Liston-Folb, Stamford, Conn., has issued a four-page bulletin on the model 10 breaker-type d-c amplifier, an electronic unit designed to replace high-sensitivity galvanometers. Included are a block diagram of the amplifying system and performance and characteristics charts. A price list is also available.

Heterodyne Eliminator. J. L. A. McLaughlin, P. O. Box 529, LaJolla, Calif. A recent bulletin treats the MCL-4 Signal Splitter, an asymmetrical off-frequency inverter-type heterodyne eliminator. The unit described was intended for radio press services, airway ground-station control, or wherever off-frequency interference is likely to mar the reception of the vital radio intelligence.

Vacuum Rectifier. Radio Corp. of America, Harrison, N. J., has published a technical data bulletin on the 6AX5-GT full-wave vacuum rectifier of the heater-cathode type intended for use in a-c operated receivers and automobile receivers. Rating and characteristics charts, dimensional outline and socket connections are given.

Crystal Impedance Meter. Lavoie Laboratories, Inc., Morganville, N. J. A single sheet is devoted to the model 50 crystal impedance meter for use in laboratories employing piezoelectric frequency-control crystals. Specifications of the unit described include a frequency range of 75 to 1,100 kc, an impedance range of 0 to 29,900 ohms and an accuracy of 5.0 percent.

Technical Ceramics. American Lava Corp., Chattanooga 5, Tenn. Chart No. 501 gives the mechanical and electrical properties of AlSi-

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miniature microphone for **lapel** *use!*

actual size

The new Altec 28A Lapel Microphone permanently incorporates the Altec 21B. Its small size makes it practically invisible when clipped to the clothing of the user. Here is a development that offers public speakers and professional people a microphone that is invisible, gives them complete freedom of movement and provides them with quality that was never before available. The 28A is held to the clothing by a jewelry clip and is equipped with 6 ft. of cable.

The 154A Matching Unit is used with the 28A and contains the necessary impedance matching tube. The size of a pack of cigarettes, it is easily carried in the pocket. Equipped with 25 ft. of cable.

Write for full information on this and other models of the Altec 21B microphone.

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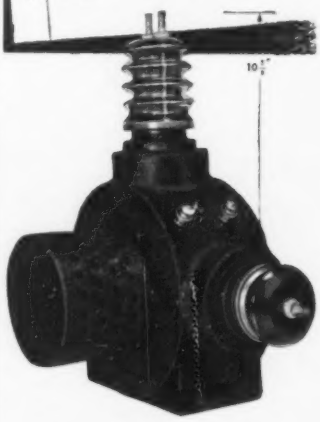

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Lots more ohms in lots less space.

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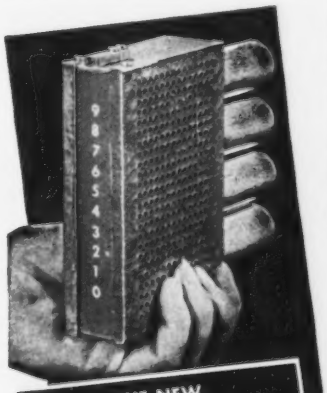

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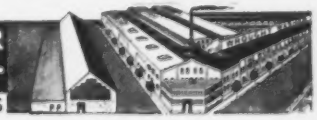

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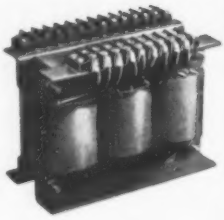

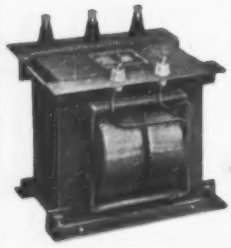

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Wire-Wound Resistors. Shallcross Mfg. Co., Collingdale, Pa. Bulletin No. 122 gives full details of the type 265A flat, metal-encased mica-insulated, wire-wound power resistors which are specifically designed for business machines and other exacting equipment where the call is for real dependability in minimum size. The resistors described are rated for 7½ watts in still air and 15 watts when mounted on a metal chassis (at 175 C continuous operating temperature.)

Boom Bracket Kit. Atlas Sound Corp., 1449 39th St., Brooklyn 18, N. Y., has published a one-page catalog release on the US-1 boom bracket kit for microphone support. It illustrates how the set-screw assembly makes it possible to cut down any tubular section so that the support bracket can be custom built to meet a specific requirement.

Nuclear Measurements. Nuclear Instrument and Chemical Corp., 223 W. Erie St., Chicago 10, Ill. Catalog K is a 40-page booklet covering 32 nuclear scaling, counting, monitoring and detector instruments. Also included are an illustrated description of 36 accessories and special instruments, service information, suggestions for ordering and a price list.

Spectrum Analyzer. Polarad Electronics Corp., 100 Metropolitan Ave., Brooklyn 11, N. Y. A single-page bulletin covers the LSA all-band direct-reading spectrum

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Premax Series "B" Center Loaded Marine Radiators, will increase effective power 5 times over that radiated by straight whips. 2' base section. 18" coil and 72" whip — 9½' overall. Will resonate at center of 2-3 Mc. band. Comes with heavy ceramic insulator Mountings, complete.

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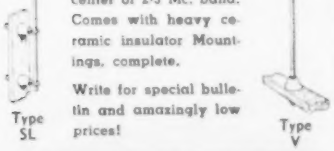

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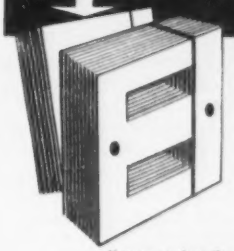

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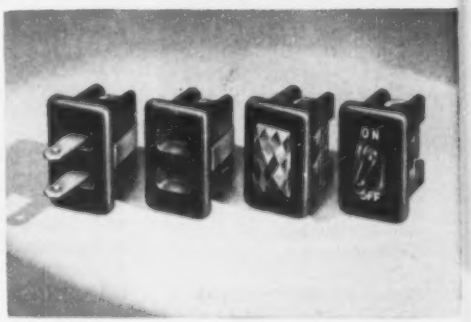

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"Diamond H" Snap-Ins . . . toggle switches, convenience outlets, pilot lights and inter-connecting load plugs . . . have always been tops for performance and for cost-saving on users' assembly lines. Just snap them into their holes, spring clips hold them tight. Wire them up before or after.

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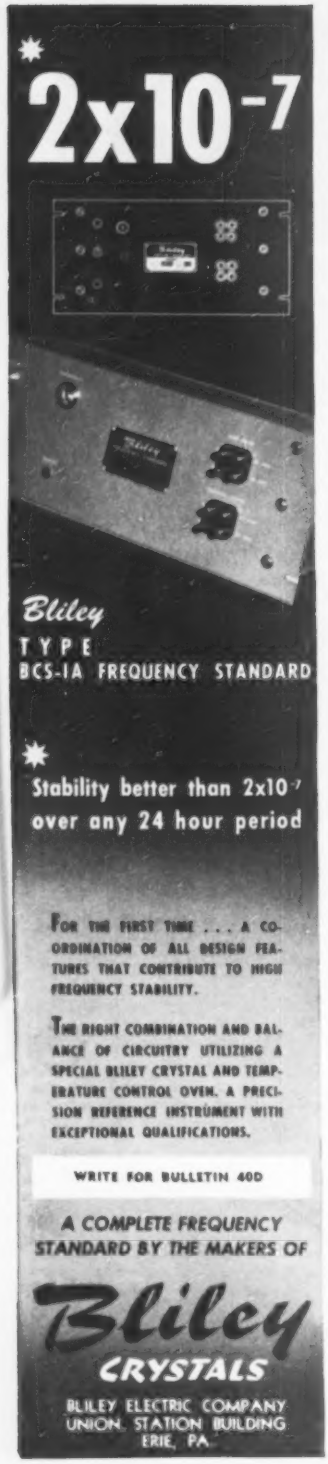
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analyzer, a laboratory instrument used to provide a visual indication of the frequency distribution of energy in an r-f signal in the range of 10 to 16,520 mc. Outstanding features and an illustration of the equipment are given.

Synchronous Timing Motor. The Bristol Motor Co., Old Saybrook, Conn. The Circle B a-c self-starting synchronous timing motor is illustrated and described in a recent four-page folder. Design, construction, lubrication, compactness, dependability and specifications are covered.

Electronics Dictionary. Allied Radio Corp., 833 W. Jackson Blvd., Chicago 7, Ill., has published a 64-page dictionary of over 2,500 terms used in television, radio and industrial electronics. Over 125 illustrations and diagrams of components, equipment and electronic circuits are included, as well as an appendix section containing useful radio data. Price is 25 cents to cover handling and mailing costs.

Circuit Control. G. H. Leland Inc., 123 Webster St., Dayton 2, Ohio, has released a four-page bulletin giving a few of the many applications of circuit selectors and stepping relays. The units described feature remote control, rotary-solenoid operation, positive detent action, and self-stepping or external impulsing.

Germanium Crystal Diodes. Kemtron Electron Products Inc., 23 Brown St., Salem, Mass. A recent four-page folder gives performance characteristics, dimensional diagram and chief features of a line of germanium crystal diodes. Specifications for eleven types are included.

Electronic Plotting Board. Electronic Associates, Inc., Long Branch, N. J., has issued a descriptive pamphlet on its model 205 Vari-

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Use SILVER GRAPHALLOY
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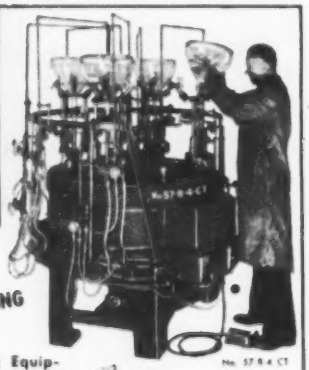

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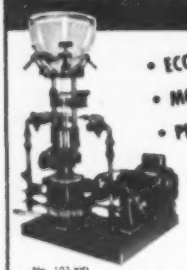

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¼ to 300 KVA

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EISLER TRANSFORMERS STANDARD • SPECIAL Air, Oil or Water Cooled

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Sizes From ¼ to 500 KVA

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plotter which is primarily designed to plot one variable as a function of another variable. Some applications of the instrument described include aeronautics, acoustics, radio, atomic research, materials and industry. Accessories are listed.

Servo Actuators. Lear, Inc., 110 Ionia Ave., N. W., Grand Rapids 2, Mich. Bulletin B-102 gives an eight-page illustrated description of the model 118 series fast-response servo actuators with the Learflux Magnadrive torque amplifier. The units described were originally made for aircraft applications and component parts are ruggedly constructed. Suggested applications and two pages of performance curves are given in the new bulletin.

Educational Magnetic Amplifier. Vickers Electric Division, Vickers Inc., 1815 Locust St., St. Louis 3, Mo. Holders of registered copies of the company's magnetic amplifier design handbook (April ELECTRONICS, p 243) will receive supplementary information on magnetic amplifiers as it becomes available. Latest issue of such data consists of three bulletins on the educational magnetic amplifier for schools and industry. One of the publications now available is a laboratory manual of specifications, instruction notes and experiments.

Electronic Instrumentation. Berkeley Scientific Co., Richmond, Calif. A six-page folder gives a cross-section of a diverse line of instruments now in production or under development. Included are illustrated descriptions of the model 700 decimal counting unit, model 410 industrial counter, model 80 portable, battery-operated scaler, model 554 meter, model 902 double-pulse generator, models 500 and 510 time-interval meters, model 1600 counting-rate computer, the Colman soil moisture unit, models 1000-B and 2000 decimal scalers, model 3500 multichannel scaler and model 3000 hand and foot monitor.

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(Synchronous)

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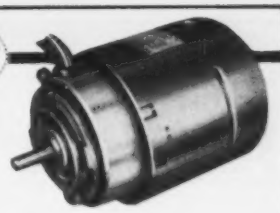

TYPE	HORSE-POWER	RPM	SIZE
LH712NQCJ	1/100	900	
	1/50	1800	3⅞" Dia. x 4-15/16"
LH712MNCJ	1/50	1800	
	1/40	3600	3¾" Dia. x 4-15/16"
LH731NCJ	1/50	1800	3⅞" Dia. x 4-9/16"
LH73QCJ	1/100	1800	3⅞" Dia. x 4-1/16"
93HSK-1	1/20	1800	4⅞" Dia. x 6-1/4"

- No Noise
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- Constant Speed
- Maximum HP
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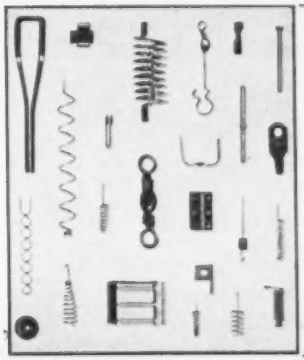

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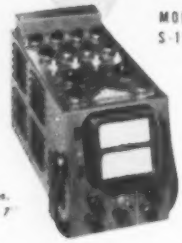
BY WATERMAN



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NEWS OF THE INDUSTRY

(continued from page 132)

26 inches high and 6½ feet in diameter, with one-inch thick walls. Inside there are a group of coils for obtaining initial betatron acceleration and subsequent synchrotron operation.

There is no separate doughnut as in the original synchrotron since the entire tank is evacuated and the electrons move in the space between the inner and outer coils. During first operation the vacuum was about a hundred millionth of an atmosphere. This allows enough gas molecules to remain to cause appreciable scattering of the electrons, though it does not prevent operation. As the vacuum is improved, to a billionth of an atmosphere or better, the scattering may be decreased accordingly.

AIEE Summer and Pacific General Meeting

THE 1950 Summer General Meeting of the AIEE has been combined with the Pacific General Meeting usually held in August, to form the 1950 Summer and Pacific General Meeting at the Huntington Hotel, Pasadena, Calif., from June 12 to 16. The tentative technical program, insofar as it is of particular interest to electronic engineers, is as follows:

Monday, June 12

2:00 P.M.—Electronics

An Oscillograph Amplifier Using A Transductor as the Input Stage, by G. W. Downs and R. Morrison of William Miller Corp.

A Simple Stabilized D-C Amplifier for Use with Electric Analog Computers, by V. Briggs of U. S. Naval Ordnance Test Station.

Magnetic Modulators, by G. Wennerberg of Leeds, Inc.

Recent Trends in the Field of Miniature Electronic Components, by M. J. Ainsworth of Bendix Aviation Corp.

Electronics Goes to the Farm, by D. Packard of Hewlett-Packard Co.

Tuesday, June 13

9:30 A.M.—Computers—Features of the ENIAC and MADDIDA computers will be covered by several papers.

2:00 P.M.—Applications of Computers to Aircraft Engineering Problems (five papers).

Wednesday, June 14

9:30 A.M.—Electronic Communication Systems for Mine Shafts, by C. M. Marquardt of Combined Metals Reduction Co.

9:50 A.M.—Particle Acceleration and Detection: Cloud Chamber Studies of Cosmic Rays, by C. D. Anderson of Calif. Inst. of Technology.

Operation of the 330 Mev Berkeley Synchrotron, by M. Martin of U. of Calif.

A 500-KV Radio-Frequency Power Supply as a Betatron Injector, by J. R. Woodyard of U. of Calif.

The Klystron as a High-Power Source for the Electron Linear Accelerator, by

Gold Plated

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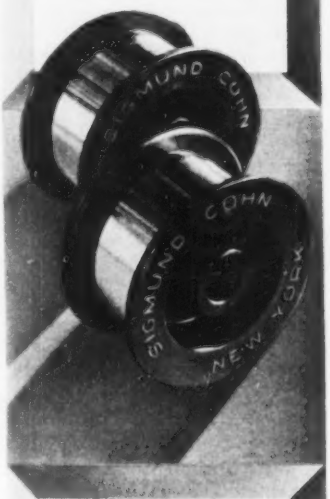

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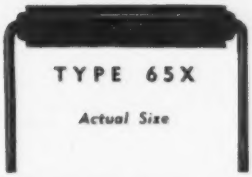

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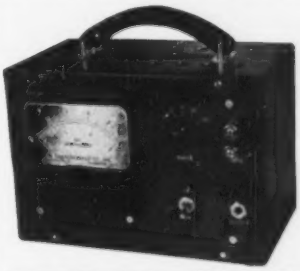

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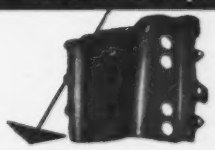

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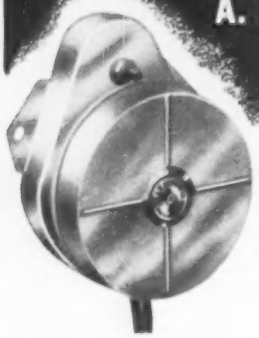

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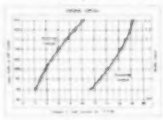

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Proton Linear Accelerators, by W. K. H. Panofsky of U. of Calif.

2:00 P.M.—Electronics

Use of Reflection Doppler Techniques for Test Range Instrumentation, by D. Kean of U. S. Naval Ordnance Test Station.

Application of Electronics to Test Range Instrumentation, by F. Ashbrook of U. S. NOTS.

A Precision Timing System for Test Range Instrumentation, by T. Parkin of U. S. NOTS.

Sound Ranging at the Morris Dam Torpedo Ranges, by R. N. Skeeters of U. S. NOTS.

Electrical Requirements for Firing Rockets by Induction, by J. F. McClellan of U. S. NOTS.

Determination of the Composition of Surface Layers by Ion Scattering, by S. Rubin of Stanford Research Institute.

Thursday, June 15

9:30 A.M.—Instruments and Measurements—Front-of-Wave Impulse Measurement Techniques, by M. M. Newman and F. Bellaschi of U. of Minn.

9:30 A.M.—Microwave Applications

Field Testing a Microwave Channel for Voice Communication, Relaying, Telemetering and Supervisory Control, by D. R. Pattison of Pennsylvania Electric Co. and M. E. Reagan, S. C. Leyland and F. B. Gunter of Westinghouse Electric Corp.

Microwave Applications to Bonneville Power Administration System, by R. F. Stevens and T. W. Stringfield of Bonneville Power Administration.

Microwave Systems for 960 and 2,000 Megacycles, by R. V. Rector of GE and W. E. Sutter of International GE Co.

940 to 960-Megacycle Communication Equipment for Industrial Applications, by F. B. Gunter of Westinghouse Electric Corp.

Problems to be Solved in the Application of Microwave Equipment, by R. C. Cheek of Westinghouse Electric Corp.

2:00 P.M.—Instruments and Measurements

The Status and Applications of Microwave Spectroscopy, by W. D. Hershberger of U. of Calif.

2:00 P.M.—Conference on Carrier Current

A Low Noise and Distortion Audio Multiplexing Equipment with High-Stability Carrier Supply, by F. S. Beale of Westinghouse Electric Corp.

Friday, June 16

9:30 A.M.—Symposium on the Fevatron

Pulsed Power Particle Accelerators, by G. Farley of U. of Calif.

Multi-Purpose Generators and Controls for High-Energy Particle Accelerators, by G. L. Godwin and L. A. Kilgore of Westinghouse Electric Corp.

Ignitron Converters for High-Energy Particle Accelerators, by J. L. Boyer and C. R. Marcum of Westinghouse Electric Corp.

Design and Preliminary Operation of the Bevatron with Emphasis on the Magnetic Circuit, by D. Sewell of U. of Calif.

Frequency Control for the Bevatron R-F Voltage, by J. Reidel of U. of Calif.

9:30 A.M.—Substations

Automatic Control of Ignitron Rectifier Stations, by E. J. Cham and W. A. Derr of Westinghouse Electric Corp.

Multi-Station Supervisory Control, Telemetering and Communication on Single-Frequency Carrier Channel, by W. A. Derr and J. V. Kresser of Westinghouse Electric Corp. and T. C. Wren of Sierra Pacific Power Co.

System-Wide Fast-Response Telemetering, by G. W. Dupree of Southwestern Public Service Co.

Use of Ultrahigh-Frequency Equipment for Supervisory Control and Telemetering, by L. E. Ludekens of Southern California Edison Co., Ltd.

2:00 P.M.—Magnetic Amplifiers and Transformers

The Design of Broadband Transformers for Linear Electronic Circuits, by H. W. Lord of GE Research Laboratory.

General Characteristics of Magnetic Amplifiers, by L. A. Finzi and D. C. Beanmariage of Carnegie Inst. of Technology.

Response Time of Magnetic Amplifiers, by E. L. Harder and W. F. Horton of Westinghouse Electric Corp.

The Extension of Amplistat Performance by Alternating-Current Components, by R. E. Morgan, H. M. Ogle and V. J. Wattenberger of GE Co.

Theory of the No-Load Characteristics

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Curves and pictures in instrucetion book tell how to read intermodulation percentage directly, how to determine harmonic distortion, how to adjust an amplifier for best performance quickly by using the screen images as a guide.

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CORRECT ADJUSTMENT

Experience shows that an amplifier adjusted for low IM will also have low harmonic distortion, but the reverse is not true. Low harmonic distortion does not assure low IM.

This unit tests over a wide frequency range and at 1:1 or 4:1 voltage ratio of the two frequencies. It permits separate testing of low and high frequency overload.

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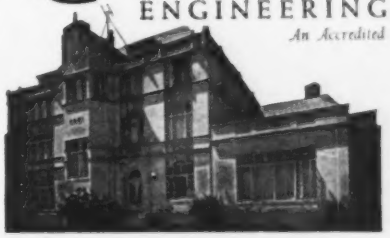

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of Highly Saturable Reactors with Hysteresis, by A. Hanes, Jr., of U. of Calif.
2:00 P.M. Electronic Power Converters
High-Voltage Rectifier Equipment and Control for Tube Testing, by S. R. Durand of Allis-Chalmers Mfg. Co.
High-Voltage Ignitron Rectifiers, by M. J. Mulhern of GE Co.
Ignitron Pulse Equipment for Particle Accelerators, by C. C. Herskind and J. E. Hudson of GE Co.
A Brief Pictorial Story on the Early Development of the Mercury Arc Rectifier, by W. C. White of GE Co.
Survey of Operation of Mercury Arc Rectifiers, by Committee on Electronic Power Converters.
Protection of Electronic Power Converters, by Committee on Electronic Power Converters.

BUSINESS NEWS

UNITED GEOPHYSICS CO. will form a permanent home in $250,000 quarters at Pasadena, Calif., for the manufacture of electronic instruments used in the earthshock method of exploring subterranean formations.

HERMAN H. SMITH, INC., manufacturer of radio hardware, electronic components and television accessories, has moved to new and larger quarters at 436 18th St., Brooklyn, New York.

SONOTONE CORP., manufacturers of hearing aids and other electronic devices, have been licensed by Allen B. Du Mont Laboratories, Inc., to manufacture and sell the Du Mont bent-gun mount to all television tube manufacturers.

CENTRALAB DIVISION OF GLOBE-UNION INC., Milwaukee, Wisc., has acquired a new 46,000-sq ft plant in Denville, N. J., for the exclusive production of a full line of ceramic capacitors.

ADVANCE ELECTRIC & RELAY CO., manufacturers of relays for general circuit control, electronic, aircraft and marine applications, is now occupying its new 20,000-sq-ft plant at 2435 No. Naomi St., Burbank, Calif.

JOHN VOLKERT METAL STAMPINGS, INC., Queens Village, N. Y., recently passed the 1,500,000 mark in the production of sets of metal parts for electron guns used in television tubes. This figure represents over one-third of the total number presently produced for tv receivers.

RAYTHRONIC LABORATORIES, INC., Cincinnati, Ohio, has been formed

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- Frequency compensated high impedance attenuator calibrated in 10 db steps from 0-50.
- Fine attenuator covers a 10 db range.
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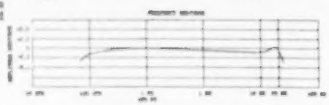

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Input Impedance: Probe—12 mmf ÷ 470,000 ohms; Jack—30mmf ÷ 470,000 ohms. Output Impedance 15mmf ÷ 470,000 ohms each side push pull; Max. Input Volts 500 peak to peak with probe; Max. Output Volts 120 volts peak to peak (push pull); Power: 115 volts 50-60 cps AC Line; Size 19¼"x22"x14¾".

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to deal in electronic materials and devices and to do research in radio and radar equipment. The firm will bid on government contracts for aeronautical research work.

CENTRALAB DIVISION OF GLOBE-UNION INC., Milwaukee, Wisc., recently acquired two buildings formerly occupied by the Eclipse Molded Products Co., Milwaukee, and will devote the space exclusively to the manufacture of electronic component parts.

CORNING GLASS WORKS, Corning, N. Y., has begun construction of a 300,000 sq-ft-floor-area plant in Albion, Mich., to provide additional manufacturing capacity for television glass requirements.

AIR KING PRODUCTS CO., INC., Brooklyn, N. Y., has acquired 40,000 additional square feet of space in the Kenyon Bldg., Brooklyn, N. Y., to expand production capacity for television receivers.

THE WORKSHOP ASSOCIATES, INC., Newton Highlands, Mass., has moved to a new building on Crescent Road, Needham Heights, Mass., to accommodate increased

Workshop Associates new building

research and development activities and to provide expanded production facilities for a new television antenna.

PERSONNEL

ROBERT A. STAREK, formerly commercial engineer for the radio tube division of Sylvania Electric Products, Emporium, Pa., was recently appointed field engineer of the division.

RICHARD G. LORRAINE, at one time engaged in the design and development of the network analyzer and later assigned to work on problems of utilizing atomic energy as a source of power in the production of

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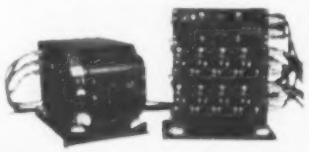

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electricity, was recently named head of a new project in the Knolls Atomic Power Laboratory, operated for the AEC as part of the GE Research Laboratory, Schenectady, N. Y.

NORMAN B. KRIM has been promoted from assistant vice-president and manager of the receiving tube division to vice-president in charge of the same division at Raytheon Mfg. Co., Waltham, Mass.

N. B. Krim

R. L. Harding

ROBERT L. HARDING, secretary of the National Telemetering Forum, has been promoted from project engineer to staff engineer of the products division of Bendix Aircraft Corp., South Bend, Ind.

THEODORE W. JARMIE, one of the original founders of Electronic Associates, Long Branch, N. J., has joined the Electronic Engineering Co. as resident project engineer at the Naval Air Missile Test Center, Point Mugu, Calif.

JOHN F. HARRIS, engaged in transformer engineering with the American Transformer Co. for the past 16 years, recently became chief transformer engineer at Langevin Mfg. Corp., New York, N. Y.

LAWRENCE HYLAND, vice-president in charge of engineering research at Bendix Aviation Corp., was recently awarded the Navy's distinguished public service award for his service to science and to the welfare of the U. S. through his contribution to the early development of radar.

G. PRYOR MOLLOY, formerly associated with RCA, has been named head of the field engineering department, Industrial & Electronics Division of American Structural Products Co., Columbus, Ohio.

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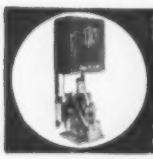

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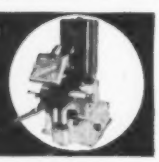

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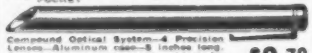

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vices as well. Yet there is today no good, concise, definition which meets all the usages commonly associated with the term.

While it is true that we have progressed thus far without a complete definition and that no insuperable obstacle to future progress may be interposed by its lack, it would still be a most valuable adjunct to activities dealing with the allocation of research tasks, research funds, scientific personnel and the like in almost any large-scale enterprise including in its scope the art or science of electronics. Its value in that connection is, of course, of secondary importance when compared with the feeling of satisfaction which would accrue to each and every one of us if he were able to point to a definition and say: "That's what I do!"

Consequently, a group of us has studied the available attempts at formulating such a definition and we present, humbly and without setting it up as a finished piece of work, the following version:

> Electronics The science and technology dealing with the emission, behavior and effects of electrons in gas-filled or vacuum tubes or with photoelectric, photoconductive, semiconductor or similar devices, and/or the control or production of electric or electromagnetic energy therefrom, (but excluding chemistry and power engineering).

We hope that this definition may be published in your columns with a request to the readers to comment, constructively, on its content. We should like to stress that it is not necessarily a complete nor all-inclusive definition but affirm that at the same time considerable thought has gone to the detailed wording therein so as to try to encompass most of the varied phases of electronics without including extraneous material. We believe that if the suggestions submitted by your readers are collated and combined to form a concise definition and published in ELECTRONICS it would go a long way towards filling this need and may then be considered an authoritative definition.

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(Continued on page 246)

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Well equipped laboratories in modern radio plant . . . Excellent opportunity . . . advancement on individual merit.

Baltimore Has Adequate Housing

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BENDIX AVIATION CORPORATION
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MOTOROLA RESEARCH LABORATORIES, PHOENIX, ARIZONA

The new Motorola laboratory building with one acre of floor space devoted to electronic research and development is located in a beautiful residential area adjacent to Arizona Country Club. Housing in surplus supply. Climate ideal.

A limited number of fully qualified engineers and assistants will be added to the staff.
Qualifications:

ENGINEERS:
(1) Graduate of accredited engineering school.
(2) Five or more years of responsibility, charge of commercial research, development, or manufacturing projects.
(3) Specialists in
A. VHF and UHF receiver design
B. Microwave communication pulse circuits
C. UHF, VHF and Microwave antenna design
D. Telemetering and multiplexing
(4) Originality and inventive ability of major importance.

ASSISTANTS:
(1) Engineering Graduate
(2) Electronic experience, commercial, hobby or military

Qualified men interested in permanent employment should state education, experience and past salary schedules in first letter. Information confidential. Address

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Camden, N. J.

Requires Experienced Electronics Engineers

RCA's steady growth in the field of electronics results in attractive opportunities for electrical and mechanical engineers and physicists. Experienced engineers are finding the "right position" in the wide scope of RCA's activities. Equipment is being developed for the following applications: communications and navigational equipment for the aviation industry, mobile transmitters, microwave relay links, radar systems and components, and ultra high frequency test equipment.

These requirements represent permanent expansion in RCA Victor's Engineering Division at Camden, which will provide excellent opportunities for men of high caliber with appropriate training and experience.

If you meet these specifications, and if you are looking for a career which will open wide the door to the complete expression of your talents in the fields of electronics, write, giving full details to:

National Recruiting Division
Box 600, RCA Victor Division
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SENIOR ELECTRONIC CIRCUIT PHYSICISTS

for

Advanced Research and Development

MINIMUM REQUIREMENTS:

1. M.S. or Ph.D. in Physics or E.E.

2. Not less than five years experience in advanced electronic circuit development with a record of accomplishment giving evidence of an unusual degree of ingenuity and ability in the field.

3. Minimum age 28 years.

Hughes Aircraft Company
Attention: Mr. Jack Harwood
CULVER CITY, CALIFORNIA

SEARCHLIGHT SECTION

(Continued from page 244)

EMPLOYMENT AGENCY

ELECTRICAL ENGINEERS: Teaching: Power, Electronics. All ranks to Head Department Universities, Atlantic-Pacific. To $8000. Give phone. Photo. Qualif. **Cline Teachers Agency,** East Lansing, Mich.

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PHYSICIST. VETERAN. Over ten years' actual working experience (electrical, elec. gas discharges, electronics, dielectrics, infra-red, magnetic, servo-control, etc.). Testing development, and research (experimental and analytical). Experienced in planning and completing projects and in directing personnel, also in discussing projects with government agencies for procurement of contracts. Has acted as consultant for government agencies and industry. Has been head of Physical Dept. of small research organization for past five years. Wishes to join an organization which can offer a future commensurate with his abilities. Competent and reliable. Solid scholastic background. PW-6414, Electronics.

M.D.-BIOPHYSICIST. 39. Fully qualified internist plus a good background, including research experience, in electronics as applied to medicine and biology, biologic effects microwaves and biologic ultrasonics. Can contribute biologic and clinical know-how to a team developing medical or biological electronic instrumentation. Qualified in industrial toxicology and aviation medicine. Desires position in electronic industrial establishment where background will be useful in research program and in industrial medicine. PW-6495, Electronics.

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SALES ENGINEER—Annapolis graduate with six years experience desires sales representative position with electronic or electrical firm. Resume on request. RA-6592, Electronics.

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Patented Machine

Washes venetian blinds. Highly profitable. Visit one of 50 successful plants near you. Free Booklet. $4350.00 in 24 payments. C. C. Equipment Co., 101 S. 44th St., Phila. 4, Penna.

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ANYTHING within reason that is wanted in the field served by Electronics can be quickly located through bringing it to the attention of thousands of men whose interest is assured because this is the business paper they read.

WE WANT: Manufacturer with new lines for service and or sales direct to industrial or home user. Northern New Jersey area.

WE OFFER: Wide experience industrial electronics, TV, radio, interfirm, etc. showrooms, outside sales staff, 3 service cars, laboratories with latest test instruments, financial investment considered.

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Veteran. Over ten years' actual working experience (electronics, dielectrics, gas discharges, infrared, magnetic, servo-control, etc.). Testing, development, and research (experimental and analytical). Experienced in planning and completing projects and in directing personnel, also in discussing procurement of contracts with government agencies. Has acted as consultant for government agencies and industry.

Has been head of Physical Dept. of small research organization for past five years. Wishes to join an organization which can offer a future commensurate with his abilities. Competent and reliable. Solid scholastic background.

PW-6417, Electronics
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ELECTROMAGNETIC F FLOWMETER
Engineer Available

Thorough background for this device, including Original Experimental and Theoretical Work.

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Competent, experienced representation with established contacts.

Openings available for a very limited number of lines.

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Manufacturer offers for sale complete inventory including finished equipment, jigs, test equipment, engineering drawings and lab samples to manufacture television distribution system for apartment buildings. Operates by means of channel amplifiers utilizing 4-6AK5's per channel which feed coax cable with attenuating take off at each set. Reason for sale—other products using full capacity.

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For column printing—potential speed is several thousand lines per minute. For communications—extremely simple teleprinting circuit and mechanism. Basic protection involved; Inventor ownership—outright sale preferred.

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CONTRACT
ENGINEERING—MANUFACTURING
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LARGE QUANTITIES IN STOCK
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Also offer small lots of other similar items.

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ATTENTION: We are instructed by our customers to PAY HIGHEST prices for all kind of CONDENSORS, RESISTORS, VOLUME CONTROLS, etc.

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Birtcher Tube Clamps
926C
926-16
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926-C15
926-C-13
926B
926-C-19
926B-16
926A-14
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Each 15¢
10 $1.40
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ARC/5 Switching Relay w/Ant current ind. w/19.5 Millivolt Movement, current Xfrmr & Thermocouple 2.79

Yagi Switch encl in Inct. Box 24 VDC for BC 929 Scope w/Toggle Sw. 6 Plugs. Shock Mt. 5¾ x 5¾ x 7½ .. $3.00

Universal Output Transformer
Amertran Silcor. PRI: 20,000/16,-000/5000/4000 ohms. Sect. 500/18/7.5/5/3.75/1.25 ohms. 30 db. contin. Flat to 17,000 CY, w/ Diag. & Inst. for 6 watt amplifier $4.75

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TR 1210, 12 vdc, 5 pin $1.00
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Mal. Type G629-C, 12 vdc, 4 pin $1.00
Mfrs. quantities in all types available.

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Convert to high fidelity phone Amp. or speech Amp. Complete with tubes and dynamotor, for 24 V. DC operation. Used but in good condition. SPECIAL PRICE $2.29

Heineman Ckt. Bkrs. for AC-DC Operation
Amperes .010, 3, 7, 50, 80, 100, 150. Ea. $1.10
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ARC/5 Xmtrs VFO Drivers
40 Watts Output
2.1—3 Mc $6.95
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Used Good Cond.

Superhet Recvrs w/Dyn Used Good
Can be converted to 110v 60 cy.
190-550 Kc 7.95
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80 Mtr. Xmitr. Conv. Kit $1.50
Fuses, 10A, 3AG ..... .04
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PLUGS FOR ARC-5
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Mfrs. quantities in all types available.

2 KVA: 90 130v input 50-60 cycles, output 115v 2 kva type RH Amertran $7.95

BC-603 FM Receiver Push-button 23-28 MC. Can easily be converted to 10 mtr. coverage (25-32 MC). Used, Good. Price $12.50

NAVY ARB RECEIVER
195 Kc thru 9 Mc. Includes broadcast band. Can be converted easily to a good ham receiver. 28 V. DC input. Covers 4 bands. This is a deluxe type super-het receiver. Note: The frequency coverage includes the standard broadcast band. Has 4-gang tuning condenser; can be converted to 110 V. AC receiver. Complete with tubes: 12SF7, 12SA7, 3—12SF7 and 12A6. Dial is built on front of chassis. Electric driven or Manual band change switch. Weight 28 lbs. Size 6" x 7" x 15". Complete with tubes and dynamotor. (Fair as is Cond.) $19.95

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Designed for Mobile and Aircraft 2000 to 9050 Kc for Xmting, 187-13950 Kc Recvg. Using T.U. 12-15 watt. Rec Less T.U. 3.95
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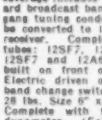

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F Range 2.04-3 MC
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I-1.2 MC
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1,000,000	Bathtubs
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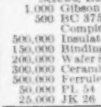

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Used to extend range of field telephones, Simplex Teleg. and 20 cycle ringing possible over lines equipped with unit. Supplied w/303 tube. Phone supplied. (Featherweight) $9.75

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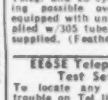
To locate any kind of trouble. Battery can be used as telephone. Includes ringing circuit etc. A valuable unit .. $18.98



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V 60 cy input Price $5.95

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VACUUM 45 Sec. 117v 60 cy Metal Tube, 4 Prong Edison Price $1.95
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Special Xfmrs. 115v 60 cy.
30v/3.5A for Rect., etc. 2.75
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1000 Vct/55Ma, 2x6.3/1.2A 4.48
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0-5 MA & 0-5 V Scale w/10V Movement 2" Metal Case Readrite Meter 98¢ ea. 10 for 9.00

FREQ METER CABINET
For BC221 Wood. New $2.95

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Mfd.	Volt	Price
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.5.5	400	.50
1	600	.45
2	600	.98
7	600	1.05
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8	1K	.65
1.8	1K	.75
2	1K	.99
4	1K	.98
10	1K	1.95
15	1K	2.98
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1	1.5K	.89
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15	4K	2.95
1.1	4.5K	2.95
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1	7.5K	12.95
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1	10K	14.95
.0016	15K	7.95
1	15K	30.95
.015	16K	6.95
.25	20K	14.95
.5	25K	34.95
1	25K	83.95
4	50	.29
1	100	.15
2.5	100	.23

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TU1BA 3-4.5 Mc 2.50
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BC-620 Mobile FM TRANSCEIVER — P.O. SCR-610. Includes 10 meter band. Excellent condition with tubes $15.95
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200VDC

2x.1	2ST	.15
2x.1	3TT	.15
2x1	4ST	.16
.2	2ST	.20
.5	2TT	.15
.5	2ST	.15
400VDC		
2x.25	3ST	.21
2x.1	3ST	.21
2x.1	2TT	.20
3x.1	3ST	.25
.1	2TT	.19
.5	3TT	.19
1	2ST	.23
2	2ST	.26
600VDC		
.1	2BT	.20
.1	2ST	.21
2x.1	3ST	.27
2x.1	3BT	.25
2x.1	2ST	.26
3x.1	ST	.25
2x.25	3ST	.23
.25	2TT	.20
1	2ST	.30
2x1	3ST	.35
2	2ST	.40
2	2BT	.39
1000VDC		
1	2ST	.45
MANY OTHERS		33.95

BC-733D SUPERHET RECEIVER
w/10 Tubes, 6 Selector-Relays operates on Xtal Controlled Freq. 108.3-118.3 MC. Can easily be converted to 2 Mtr. ham bands ..... 7.95 ea.

SCR 522 VHF XMTR-RCVR
10 Tube Xtal Controlled Recv. 7 Tube Xmtr. Makes ideal 2 Mtr. 2 way mobile rig for Cabs, etc. 100-156 MC w/Tubes 33.95

BC 223 XMITR
30 Watt Transmitter with crystal oscillator control on four preselected channels — also master oscillator. Frequency coverage 2000 KC. to 5250 KC. by use of three plug in coils. Five tube operation, 801 oscillator, 801 power amplifier, two 46 modulators, and one 46 speech amplifier. Price with TU-17 Tuning Unit, 2000 to 3000 KC 32.95

GIBSON GIRL
The Emergency Radio Transmitter. Sends S O S signals automatically on 500KC. 150-mile range. No batteries required. Has hand-driven generator, tubes, wire. New. It's only $3.49

ARC 3 MINIATURE RELAYS
Can SPDT 5 Prong GECR2781C104 ..... 1.99

SPDT	28 vdc	300	RBM55342
6PST	22-28 vdc	300	RBM5528
SPST	22-28 vdc	300	RBM55251
DPDT	22-28 vdc	300	RBM55531
DPST			
SPDT	22-28 vdc	300	RBM55526

Ceramicons

Mmc	
1	25
3	27
3.1	35
4	39
5	47
6	50
7	57
8.5	58
11	60
15	62
20	67
24	70
79	220
115	240
125	250
150	350
180	1000
200	
100	750

Feed Button	Thru	
40	100	50
180	200	
175	500	470
185	100	950

ARR2 Homing Rec.
334-358 MC w/Dia. To convert to 2 Mtrs. w/Dyn ... 5.75

RS/ARN 7 Compass Rec.
ADF Rec. 100 to 1750 KC. in 4 Bands Single Gang Tuning Capacitor w/18 Tubes, 4-6K7, 1-6L7, 1-6J5, 2-6B8, 2-6F6, 1-6N7, 1-6SC7, 2-2051, 1-524, Excellent $35.00 Good 30.00

Control Remote For Above $4.49

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RG 8/U, 52 ohm ..... .
RG 9/U, 52 ohms .$.25/Ft.
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Many other Cables & Wire in stock. Write.

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BC-605 Interphone Amplifier
Easily converted to an ideal Intercommunications set for office-home-or factory. Original New w/conversion Diagram $4.75

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FT 234A For 274N Trans
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MT 85/ARC5 Junction Box
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FT 308A P/o PE119A
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FT 265A P/o BC-701
MT 171A/U SAR
MT 7/ARR2 R4/ARR2
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Write for Many Others

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D	Lord	A1	1 1/4x1 1/4x3/8H	10¢
D	Lord	A6	1 1/4x1 1/4x3/8H	10¢
D	Lord	A9	1 1/4x1 1/4x3/8H	10¢
B	Lord	A15	1 3/4x1 3/4x5/8H	15¢
B	Lord	A12	1 3/4x1 3/4x9-16H	15¢
B	Lord	A35	2 1/4x2 1/4x1"H	18¢
C	Lord	A5150-C	2 1/2x2 1/2 3x1 1 8H	35¢
F	Lord	A4	1 23/32x1 23/32x1"H	35¢
C	Lord	A1	1 11.16x1 11.16x3 4"H	16¢
C	Lord	A10	2 3.8x2 3.8x1 1 16H	25¢
C	Lord	A8	2 3.8x2 3.8x1 1 16H	20¢
H	Lord	A35	3x3x1 1.2H	45¢
H	Lord	A20	3x3x1 5x8H	39¢
H	Lord	A25	3x3x1 5x8H	45¢
H	Menefee	A55	3x3x1 5x8H	49¢
H	Lord	A15	3x3x1 1.2H	35¢
H	Lord	A45	3x3x1 1.2H	49¢
A	Barry	AC2070	3x3x1 1.2H	55¢
A	Barry	AC2060	3x3x1 1.2H	55¢
A	Barry	AC2070H	3"x3"x1 1.2H	55¢

Shaft 6 1.5"Lx3 8" Dia. Thread both sides with nuts, washer, and two woven leads ..... ea. 35¢
WRITE FOR TYPES NEEDED

MICA CAPACITORS
SOLAR XMB—TAPPED HOLES

Mfd.	Price
2500 V Test	
.00001	$.35
.000025	.35
.00003	.35
.00005	.35
.000075	.35
.0001	.35
.00015	.35
.00025	.35
.0003	.35
.0004	.35
.0005	.35
.00075	.35
.00085	.35
.001	.50
.0015	.50
.0016	.50
.0017	.55
.002	.55
.0023	.65
.003	.75
.004	.95
.005	.95
.0056	.95
.006	.95
.0063	.95
.0069	.95
.007	.95
.0075	.95
.0076	.95
.008	.95
.01	1.05
.01	1.25
.015	1.25
.02	1.30
.025	1.30

Mfd.	Price
.027	1.35
.03	1.45
5000 V Test	
.0015	1.25
.002	2.00
Solar XQ Solder Lugs 2500 V Test	
.01	1.25
.015	1.30
.02	1.50
.04	1.75
.001	.60
.0015	.60
.002	.75
.0022	.75
.0023	.75
.0024	.75
.0025	.75
.0027	.80
.003	.80
.004	.85
.005	.90
.0056	.95
.006	.95
.0063	.95
.0075	1.00
.0076	1.00
.008	1.05
.0085	1.20
.0095	.60
.00085	.70
.00015	.60
Write For Many Others	

1000000 IN STOCK

COMPLETE LINE OF RECTIFIERS
SEND YOUR SPECS

Line FILTER, GE 100 Amp Filter w/2x5Mfd 50V oil cond. Operates on 110V AC DC $1.98

KW LINE FILTER clean up BCI & TVI, with 4-.002 Mfd. Cond. Easy to Mount $3.95

RUBBER COVERED CABLE
4½ ft long w/red, blk. & white leads for Mike or Hdset ..... 12¢
10 for $1.00

Write for Latest Flyer

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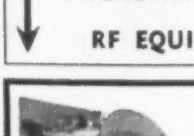
131 Liberty St., New York, N. Y. Dept. E-6 MR. CHAS. ROSEN **Phone: Digby 9-4124**

COMMUNICATIONS EQUIPMENT COMPANY

MICROWAVE ANT
RF EQUIPMENT



MICROWAVE ANTENNAS

APS-4 3 cm. antenna. Complete, 14½ dish. Cutler feed dipole directional coupler, all standard 1" x ½" waveguide. Drive motor and gear mechanisms for horizontal and vertical scan. New, complete $65.00

AN-122 Dipole Assy $22.50

LP-21-A ADF Loop W-Selsyn and Housing, New $8.00

DAK Bellini Tosai DF Loops $125.00

Adcock DF Arrays. Complete $65.00

SA Radar 200 Mc Bed Springs. Complete with Pedestal, Less Drive $600.00

APS-15 Antennas. New $99.50

AN MPG-1 Antenna. Rotary feed type high speed scanner antenna assembly, including horn parabolic reflector. Less internal mechanisms. 10 deg. sector scan. Approx. 12'L x 4'W x 3'H. Unused. (Gov't Cost—$4500.00) $250.00

AN/TPS3. Parabolic dish type reflector approx. 10' diam. Extremely lightweight construction. New in 5 carrying cases $89.50

RELAY SYSTEM PARABOLIC REFLECTORS: approx. range: 2000 to 6000 mc. Dimensions: 4' x 3' rectangle, new $15.00

TDY "JAM" RADAR ROTATING ANTENNA, 10 cm. 30 deg. beam, 115 v.a.c. drive. New $100.00

DBM ANTENNA. Dual, back-to-back parabolas with dipoles. Freq. coverage 1,000-4,500 mc. No drive mechanism $65.00

AS125/APR Cone type receiving antenna. 1030 to 3200 megacycles. New $4.50

140-600 MC. CONE type antenna, complete with 25 sectional steel mast, guys, cables, carrying case, etc. New $49.50

ASD 3 cm. antenna, used, ex. cond. $49.50

YAGI ANTENNA AS-46A.

APG-4, 5 elements $14.50

Dish for Parabola 30" $4.85

AS17/APS 10 CM Antenna. APS-2 30 inch Dish with ¼ Coax Dipole and fittings. New and Compl. with 24 V DC Drive motor, selsyn 360 Deg. Rotation and Vertical Tilt $95.00

RC-224 Antenna, 10 CM, 30" Dish P/O SCR-717 Radar. New and Complete. $95.00

R. F. EQUIPMENT

LMTR LIGHTHOUSE ASSEMBLY. Part of RT-39/APQ 5 & APQ 13. Receiver and Trans Cavities w/ Assm. Tr. Cavity and Type N CPL'G. To Recv. Uses 2C48, 2C43, 1B27. Tunable APX 2400-2700 MCS. Silver plated $49.50

APS-2 10CM RF HEAD COMPLETE WITH HARD TUBE (7158) Pulser, 214 Magnetron 417 A Mixer all ⅞" rigid coax incl. rear, front and A $210.00

Beacon lighthouse cavity 10 cm with miniature 28 volt DC FM motor. Mfg. Bernard Rice ..... $47.50 ea.

T-128 / APN-19 10 cm. radar Beacon transmitter package. Used, less tubes ..... $58.50 ea.

Pre-Amplifier cavities type "M" 7410590GL, to use 446A lighthouse tube. Completely tunable. Heavy silver plated construction ..... $37.50 ea.

RT-32/APS 6A RF HEAD Compl. with 725A Magnetron magnet pulse xfmr. TR&A TR 723 A/B local osc. and beacon mount, pre amplifier. Used but Good cond. $97.50

AN APS-15A "X" Band compl. RF head and mod. incl. 725 A mag and magnet, two 723A/B klystrons (local osc. & beacon) 1B24, TR cyer and ampl. duplexer, HV supply blower, pulse xfmr. Peak Pwr. Out: 45 KW apx. input: 115, 400 cy. Modulator pulse duration .5-2 microsec. apx. 15KV. PK. Pulse, with all tubes incl. 7158, 829B, BKR 73, two 727 s. Complete pkg. $350.00

S BAND AN/APS2. Complete RF head and modulator, including magnetron and magnet, 417A mixer, TR receiver duplexer, blower, etc., and complete pulser with tubes, used, fair condition $75.00

AS6-500 Megacycles Radar Receiver with two GL 446 lighthouse cavities, new less tubes $37.50

10 CM Rec Assy. Less Local OSC. Tube. Consists of mixer stabilizer cavity to MC preamp AFC, Inc. Amp. plugs & cables p o APS-2 ..... $37.50

#SCR-520 RF Head Compl. with Hard Tube Pulser c/o 2 Aluminum Drums MTD. to Tandem. Compl. w/Tubes $150.00

Mark 4 Radar Console (FD) Compl. "L" Band RF Pkg. c/o Magnetron CSC, Pulser, Rcvr, H.V. Power Supply. Complete $350.00
115 V. 60 cy. operation

PULSE EQUIPMENT

MIT MOD. 3 HARD TUBE PULSER: Output Pulse Power 144 KW (12 KV at 12 Amp). Duty Ratio: .01 max. pulse duration .5, 1.0, 2.0 microsec. Input voltage: 115v. 400 to 2400 cps. Uses 1-715B, 4-829-B, 1-72's, 1-73. New w/Tubes $110.00

APG-13 PULSE MODULATION. Pulse Width .5 to 1.1 Micro Sec. Rep. rate 624 to 1348 Pps. Pk pwr. out 35 KW Energy .0315 joules $49.00

TPS-3 PULSE MODULATOR. Pk power 50 amp. 24 KW (1200 KW pk); pulse rate 200 PPS 1.5 microsec. pulse line impedance 50 ohms. Circuit series charging version of DC Resonance type. Uses two 705-A's as rectifiers, 115 v. 400 cycle input. New with all tubes $49.50

APS-10 MODULATOR DECK. Complete, less tubes $75.00

APS-10 Low voltage power supply less tubes $18.50

BC 1291B Loran pulse modulator $125.00

BC 758A Pulse modulator $195.00

725A magnetron pulse transformers ..... $18.50 ea.

MAGNETRONS

Ask for Qty. Price

Tube	Frq. Range	Pk. Pwr Output	Price
2J27	2905-2992 mc.	275 KW.	$8.50
2J31	2820-2860 mc.	265 KW.	$25.00
2J21 A	9345-9405 mc.	50 KW.	$25.00
2J22	3267-3333 mc.	268 KW.	$25.00
2J28	2992-3019 mc.	275 KW.	$25.00
2J27	2965-2992 mc.	275KW.	$8.50
2J32	2780-2820 mc.	285 KW.	$25.00
2J37			$45.00
2J38 Pkg.	3248-3263 mc.	5 KW.	$38.00
2J39 Pkg.	3267-3333 mc.	87 KW.	$35.00
2J40	9305-9325 mc.	10 KW.	$65.00
2J49	9000-9160 mc.	58 KW.	$85.00
2J34			$55.00
2J61	3000-3100 mc.	35 KW.	$65.00
2J62	2914-3010 mc.	35 KW.	$65.00
3J31	24,000 mc.	50 KW.	$65.00
5J30			$39.50
714AY			$25.00
718DY	2720-2890 mc.	250 KW.	$25.00
720BY	2800 mc.	1000 KW.	$50.00
720CY	2850 mc.	1000 KW.	$50.00
725-A	9345-9405 mc.	50 KW.	$25.00
730-A	9345-9405 mc.	50 KW.	$25.00
728	AY, BY, CY, DY, EY, FY, GY		$50.00
700	A, B, C, D		$50.00
706	AY, BY, DY, EY, FY, GY		$50.00

Klystrons, 723A/B $12.50; 707B $20.00

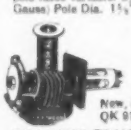
W Cavity
417A $25.00 2K41 $95.00

MAGNETRON MAGNETS

Gauss	Pole Diam.	Spacing	Price
4850	⅞ in.	⅝ in.	$12.50
5200	⅞ in.	⅝ in.	$17.50
1300	1⅛ in.	1⅛ in.	$12.50
1860	1⅛ in.	1½ in.	$14.50

Electromagnets for magnetrons ..... $24.50 ea.

GE Magnets type M7785115, GI Distance Between pole faces variable. 2⅛" (1900 Gauss) to 1½" (2200 Gauss) Pole Dia. 1⅛ Now Part of SCR 584 ..... $34.50

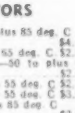


"CW" MAGNETRONS

QK 62	3150-3375 mc
QK 59	2675-2900 mc
QK 61	2875-3200 mc
QK 60	2800-3025 mc

New, Guaranteed Each $65.00
QK 615 Raytheon $150.00

FILAMENT TRANSFORMER
for above 115V/60 cy Pri; four 6.3V/4A Sec. 50000VT $27.50
Magnetron Kit of four QK's 2675-3375 inc. w/transformer $250.00



PRECISION CAPACITORS

D-163707: 0.4 mfd @ 1500-vdc. —50 to plus 85 deg. C $4.50

D-163035: 0.1 mfd @ 600 vdc. 0 to plus 65 deg. C $2.00

D-170803: 0.152 mfd, 300 v. 400 cy. —50 to plus 85 deg. C $2.00

D-164860: 2.04 mfd @ 200 vdc. 0 to plus 55 deg. C $2.50

D-163344: 2.16 mfd @ 200 vdc. 0 to plus 55 deg. C $3.00

D-161555: .5 mfd @ 400 vdc. —50 to plus 85 deg. C $3.00

D-161270: 1 mfd @ 200 vdc. temp comp —40 to plus 65 deg. C $12.50

30 US ARMY SIGNAL CORPS RADIO MASTS

Complete set for erection of a full flat top antenna. Of rugged plymold construction telescoping into 3 ten-foot sections for easy stowage and transportation. A perfect set-up for getting out. Supplied complete: 2 complete masts, hardware, shipping crate. Shipping wt. approx. 300 lbs. Sig. Corps #2A289-233-A. New ..... $39.50 per set

YD-2 MARKER BEACON EQUIP. Compl. installation in Trailer w Gas Generator—WRITE.

PULSE TRANSFORMERS

G.E.K.-2745 ..... $39.50

G.E.K.-2744-A. 11.5 KV High Voltage, 3.2 KV Low Voltage @ 200 KW oper. (270 KW max.) 1 microsec. or ¼ microsec. @ 600 PPS. $39.50

W.E. #D166173 Hi-Volt input transformer. W.E. Impedance ratio 50 ohms to 900 ohms. Freq range: 10 kc to 2 mc, 2 sections parallel connected, potted in oil $36.00

W.E. KS 9800 Input transformer. Winding ratio between terminals 3-5 and 1-2 is 1.1:1, and between terminals 6-7 and 1-2 is 2.1. Frequency range: 380-520 c.p.s. Permalloy core $6.00

G.E. #K2731 Repetition Rate: 635 PPS. Pri. Imp: 50 Ohms Sec. Imp: 450 Ohms. Pulse Width: 1 Microsec. Pri. Input: 9.5 KV PK. Sec. Output: 28 KV PK. Peak Output: 800 KW. Rifar 2.75 Amp $64.50

W.E. #D169271 Hi Volt input pulse Transformer $27.50

G.E. K2450A. Will receive 13 KV, 4 micro-second pulse on pri., secondary delivers 11KV. Peak power out 100KW G.E. $34.50

G.E. #K2748A. Pulse Input, line to magnetron $36.00

#9262 Utah Pulse or Blocking Oscillator XFMR Freq. limits 790-810 cy-3 windings turns ratio 1:1:1 Dimensions 1 13/16 x 1⅝" 19/32 ..... $1.50

Pulse 131-AWP L-421435 ..... $6.00

Pulse 134-BW-2F L-440895 ..... $2.25

RAY—WX-4296F $39.50

G.E.—K6324730 ..... $50.00

G.E.—K8021945 ..... $50.00

PULSE NETWORKS

15A—1-400-50: 15 KV, "A" CKT, 1 microsec., 400 PPS, 50 ohms imp $42.50

G.E. #6E3-5-2000-50P2T, 6KV, "E" circuit, 3 sections, .5 microsecond, 2000 PPS, 50 ohms impedance $6.50

G.E. #3E (3.84-81C; 8-2.24-405) 50P4T; 3KV, "E" CKT Dual Unit: Unit 1, 3 Sections, .84 Microsec. 810 PPS, 50 ohms Imp.; Unit 2, 8 Sections, 2.24 microsec. 405 PPS, 50 ohms imp. $6.50

7.5E3 1-200-67P 7.5 KV, "E" Circuit, 1 microsec. 200 PPS, 67 ohms impedance, 3 sections $7.50

7.5E4-16-60-67P, 7.5 KV, "E" Circuit, 4 sections, 16 microsec. 60 PPS, 67 ohms impedance $15.00

7.5E3-3-200-6PT, 7.5 KV, "E" Circuit, 3 microsec. 200 PPS, 67 ohms imp., 3 sections $12.50

DELAY LINES

D-163169 Delay Line Small quantity available $50.00

D-168184; .5 microsec. up to 2000 PPS, 1800 ohm term. $4.00

D-170499; .25/.50/.75 microsec. 8 KV, 50 ohms Imp. $16.50

D-165997: 1¼ microsec. $7.50

SONAR

QCU Magneto striction head RCA type CR 278225—New $95.00

Stainless Steel streamlining housings for above $18.50

QBG Driver Amplifier, New $200.00

QCU Magneto striction head, coil plate assembly, new $14.50

QCQ-2 QCS Magneto striction head coil plate assembly $14.50

QCQ2 Sonar complete set—Write for details.

QC-RCA magneto striction head assy. consists of coil plate, nickle diaphragm plate, milled steel body unassembled $65.00

Supersonic Oscillator RCA 17-27 Kc, Rec. Driver, Cac 115 v. 60 cy. AC. Designed for use w/200 watt driver New less tubes $39.50

WEA-1 Console. Consists of Rec. Ind. Osc. Remote training control 200 watt driver amp. 17-27 kc range $450.00

QCQ 2 Console Sub. Sig. Co. $450.00

QBF Sonar mfg. WE complete console consists of 10-40 kc rec. driver osc. ind. & control unit, and driver amplifier, 22-28 kc. Write

QJA Sonar QBF w/QJA adaptor kits w/cathode ray tube indication. Write

QCQ-2 Sonar Compl. Less Hoist—Write

I.F.F. 1 KW Pulsed Output Pkg. Tunable 154-186 mc. adj. modulating pulses 4-10 micro sec. comp. 115v 60cy ac pwr. supply $350.00
Video output receiver. New w/tubes $75.00
Wavemeter for above $85.00
Dipole Array for above $85.00
BC 800 XMTR. RCVR. Unit New $55.00
BC 929 Indicator New $38.00

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RADAR SETS

SCR 661-T3 Sperry searchlight training, aircraft, tracking, 10 CM 360° horizontal sweep 90° vert. sweep. Used $450.00

APS15 Consists of transmitt., mod. rec. ind. ant., 400 cy pwr unit, loss control, loose & cable, new $400.00

Mark 8 Model 2 Gyro stable element designed for use in stabilizing large caliber naval gun $2,500.00

APS-2	Airborne	10 CM, Major Units	New
APS-4	Airborne	3 CM, Compl.	Used
APS-15	Airborne	3 CM, Major Units	New
SD-4	Submarine	200MC, Compl.	New
SE	Shipboard	10 CM, Compl.	New
SF-1	Shipboard	10 CM, Compl.	New
SJ-1	Submarine	10 CM, Compl.	Used
SL-1	Shipboard	10 CM, Compl.	Used
SN	Portable	10 CM, Compl.	Used
SO	Portable	10 CM, Compl.	Used
SO-1	Shipboard	10 CM, Compl.	Used
SO-8	Shipboard	10 CM, Compl.	Used
Mark 4	Gunlaying	600MC, Less Ant.	Used
Mark 10	Gunlaying	10 CM, Compl. Less Rack	New
			Less Rack Used
CPN-3	Beacon	10 CM, Major Units	Used
CPN-6	Beacon	3 CM, Complete	New
CPN-8	Beacon	10 CM, Complete Less Ant.	New
SCR-533	IFF/AIR Search Tracer	500MC,	New
Airborne Radar Altimeter		500MC, Complete WRITE FOR INFO.	New

200 MC COAXIAL PLUMBING

Right Angle Bend $35.00
T Section $55.00
T Section with Adapter to ⅞" in rigid coax $65.00

X BAND

Cross gd. Directional coupler 20db Mounted on 90° bend $14.50
90° H Plane 4" Radius Cover to Cover $6.00
Directional coupler, UG-40/U take off, 20 DB ..$17.50
Directional coupler, APS-6, Type "N" take off, 20 DB, calibrated 17.50
Broad Band Directional coupler, type "N" take off, choke to cover, 23 DB, calibrated 18.50
Directional coupler, APS-3t, type "N" take off, 28 DB 17.50
Bi-directional coupler, type "N" take off 22.50
Flexible Section 18" long 12.00
Straight Sections 2½ ft. long choke to cover, silver plated 6.50
Pressure Test Section with 15 lb. gauge and pressurizing nipple 10.00
Bulk Head Feed Through, choke to cover 12.00
Mitered Elbow, choke to cover or choke to choke ..12.00
Right Angle Bend 2½" Radius, choke to cover 12.00
90° Twist, 6" long 7.50
45° Twist, 6" long 7.50
90° Twist, 5" long with pressurizing nipple 7.50
15° Bend 10", Choke to cover 4.50
5 ft. Sections UG-39 to UG-40, silver plated 9.50
180° Bend, 26" Choke to cover 2½" radius 5.00
SWR Measuring Section 4" long, 2 type "N" probes mounted full wave apart 1¼ x ½" guide 8.50
WE attenuator 0 to 20 DB, loss cards, bell size guide 12.50
90° Bend E Plane 18" 4.00
Rotary Joint, choke to choke 10.00
Rotary Joint, choke to choke with dock mounting 10.00
TR-ATR Duplexer Section for 1B24 and 724B... 12.50
Wavemeter-Thermistor MTG Section 6.00
2K25/723 AB Receiver, Local Oscillator Klystron Mount, complete with Crystal Mount, Iris Coupling and Choke Coupling to TR 22.50
TR-ATR Duplexer Section for above 8.50
721AB Mixer—Beacon Dual Oscillator Mount with Crystal Holder. Used 12.00
721AB Mixer—Beacon Dual Oscillator Mount with Matching Slugs and tunable termination, new 24.50
Bi-Directional Coupler, type "N" termination, 26 DB, calibrated, 1¼ x ½" guide 24.50
12" Flexible Section 1¼ x ½" guide 10.00
Crystal Mount in Waveguide 17.50
SO-3 Echo Box, Transmission type cavity with bellows 20.50
180° Bend with pressurizing nipple 5.00
"H" Curve 18" long 5.00
"E" Curve 6" long 3.25
APS-31 Mixer Section for mounting two 2K25s, Beacon Reference Cavity, 1B24 TR Tube 42.50
Transition 1 x ½ to 1¼ x ⅝", 14" long 8.00
Receiver Front End, complete, C/O Dual 723AB Klystron mount, TR-ATR Duplexer Section, 2 stage 30 MC. Preamplifier, new, with ALL tubes 59.50
Random Lengths of Waveguide 6 to 18" long ..... 1.00 per ft.

THERMISTORS

D-167332 (tube)	$.95
D-170396 (bead)	$.95
D-167013 (button)	$.95
D-167018 (tube)	$.95
D-164699	$2.50

WRITE FOR C.E.C. MICRO-WAVE CATALOG NOW AVAILABLE

VARISTORS

D-170225	$1.25
D-167276	$.95
D-168087	$.95
D-171812	$.95
D-171528	$.95
D-168687	$.95
D-165593	$3.00
D-168392	$1.25
D-99946	$2.00
D-161871A	$2.85
D-171121	$.95
D-162356	$2.25
D-162708	$3.00
D-98836	$2.25

S BAND

90° Twist, circular cover to circular cover $25.00
Magnetron to Waveguide Coupler with 721A Duplexer Cavity, gold-plated $45.00
Waveguide Switch—Transposes one input to any of three outputs. Standard 1½" x 3" square flanges. Complete with 115V drive motor. Raytheon CRT24AAS, new $150.00
721A TR Box complete with tube and tuning plungers $12.50
McNally Klystron Cavities for 707B or 2K28. Three types available $4.00
Right Angle Bend 5½ ft. over-all with 8" slotted section $21.00
Pick-up Dipole in Lucite Ball with Sperry Fitting $4.50
F-29/SPR-2 Filters, Type "N", Input and output $12.50
726 Klystron Mount, Tunable output, to type "N", complete, with socket and mounting bracket $12.50
WAVEGUIDE TO ⅞" RIGID COAX "DOORKNOB" ADAPTER, CHOKE FLANGE, SILVER PLATED BROAD BAND $32.50
WAVEGUIDE DIRECTIONAL COUPLER, 27 db, Navy type CABV -47AAN, with 4 in. slotted section. $32.50
SQ. FLANGE to rd choke adapter, 18 in. long OA 1½ in. x 3 in. guide, type "N" output and sampling probe $27.50
Crystal Mixer with tunable output TR pick up loop, Type "N" connections. Type 62ABH $14.50
Slotted line probe. Probe depth adjustable, Sperry connector, type CPR-14AAO $9.50
Coaxial slotted section, ⅞" rigid coax with carriage and probe $25.00
Right Angle Bend 6" radius E or H plain $27.50
Right Angle Bend 3" radius E or H plain—Circular flanges $17.50
AN/APR5A 10 cm antenna equipment consisting of two 10 CM waveguide sections, each polarized, 45 degrees ..... $75.00 per set
PICKUP LOOP, Type "N" Output $2.75
TR BOX Pick-up Loop $1.25
POWER SPLITTER: 728 Klystron input dual "N" output $5.00
"S" BAND Mixer Assembly, with crystal mount, pick-up loop, tunable output $3.00
721-A TR CAVITY WITH TUBE. Complete with tuning plungers $12.50
10 CM OSC. PICKUP LOOP, with male Hondedil output $2.00
10 CM FEEDBACK DIPOLE ANTENNA, in lucite ball, for use with parabola ⅞" Rigid Coax Input $8.00
PHASE SHIFTER, 10 CM WAVEGUIDE, WE TYPE FS-583816, E PLANE TO H PLANE, MATCHING SLUGS, MARK 4 ..... $85.00
721A TR cavities, Heavy silver plated ..... $2.00 ea.
Coax Xtal Mount for Type "N" tunable $15.00
10 CM Mixer $3.00

⅞ Rigid Coax

Directional coupler, Type "N" take off $22.50
Magnetron Coupling with TR Loop, gold-plated $7.50
Flexible Section Male to Female $4.50
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Sperry Rotating Bend, pressurized $22.50
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Rotating joint, with dock mounting ⅞" I. C. $15.00
⅞ Rigid Coax Coupler $17.50

COUPLINGS—UG—CONNECTORS

UG/15U	$ .75	UG 116 Cover & Coupling Ring	$1.95
UG206U	.90	UG 117 Choke	2.50
UG87U	1.25	UG 51 Cover	1.00
UG27U	1.00	UG 52 Choke	1.35
UG21U	.80	UG 210 Cover	1.85
UG167U	2.25	UG 212 Choke	2.40
UG25U	.90	UG 40U Special for Duplexer	.70
UG254U	1.80	⅞ Coax Female Ring Thd or unthd	.50
UG86U	1.40	⅞ Coax Male Fitting thd or unthd	.95
UG342U	3.25	X Band Circ. Choke Flange	.50
UG85U	1.45	X Band Flat Contact Flange ⅛ Thk	.25
UG58U	.80	Contact Ring ¼" Thk ⅛ dia hole	.25
UG9U	.80	UG 53/U, Cover	$4.00
UG102U	.45	UG 54/U, Choke	4.25
UG103U	.45	UG 55/U, Cover	4.00
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UG 40/U Specl. for Mixer Assy.	$ .75	UG 65/U, Contact	6.50
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UG 344 Choke	3.00	UG 150/U, Contact	3.00
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		UG 40/U, Choke	.80

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RADAR TEST EQUIPMENT

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Weston Voltmeter. Model 833, 0 to 130 volts, 400 cycle. **Price $4.00 each net.**

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1N21B	1.50	5C22	45.00	371B	.89	802	4.50	1629	.45
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1N23A	.95	5CP1	1.95	393A	4.95	804	10.95	1641	1.00
1N21	1.75	5D21	19.95	394A	4.95	805	4.95	1851	1.10
2AP1	3.50	C5B	1.95	417A	12.95	807	1.35	1852	.99
2C25	.75	5FP7	1.95	434A	3.50	808	2.75	1853	.90
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2C40	9.75	5JP2	10.95	446A	.90	810	7.50	2051	.55
2C43	12.50	5JP4	25.00	446B	1.50	811	2.11	5012A	3.95
2C44	1.25	6AC	3.95	WL468	5.95	813	7.95	5013A	2.75
2C51	7.50	6AC7	.90	WL469	2.75	814	2.95	5014A	25.00
2D21	1.25	6AC7W	1.75	WL525	2.75	815	1.50	5016	1.25
2J22	9.95	6AK5	1.16	527	7.95	827B	90.00	852	9.95
2J26	8.75	6C21	19.95	WL530	12.95	829B	8.45	860	3.75
2J27	9.75	6F4	5.95	WL531	7.95	832	4.50	861	19.95
2J31	12.75	6J6	4.95	WL532	2.95	832A	6.95	866A	1.15
2J32	12.50	6-8	.95	533	39.95	834	7.50	869B	29.95
2J36	105.00	6SU7GTY	1.25	WL535	7.75	836	1.10	872A	2.75
2J38	7.95	7BP7	4.95	WL538	1.25	837	1.95	874	1.95
2J40	25.00	7DP4	12.50	GL570	1.25	838	3.75	876	.75
2J42	150.00	10Y	.89	575A	12.50	845	4.50	878	2.25
2J48	69.50	15E	1.50	579B	5.95	849	19.95	8019	1.75
2J49	69.00	15R	1.00	700A to H	19.50	851	19.95	8020	2.95
2J50	24.50	RXZ1	2.50	701A	3.95	884	1.45	8021	1.75
2J55	95.00	CV35	15.00	703A	2.40	885	1.25	8022	1.00
2J61	65.00	RK72	.95	705A	.75	931A	3.95	8025	3.75
2J62	65.00	RK73	.95	707A	6.95	954	.45	9001	.55
2K25	19.95	OK77	249.00	707B	9.95	955	.45	9002	.35
2K28	24.95	OK59	59.00	710A	1.25	956	.45	9003	.55
2K29	24.95	OK61	49.50	714AY	4.95	957	.25	9004	.45
2K45 on Request		RK59	2.25	715A	6.95	958A	.55	9005	1.50
2K2A	69	RK49	2.40	715B	9.95	959	.75	9006	.35
3V3G	99	VR53	.29	715C	24.95				
3A4	.75	VR95	.45	717A	.95				
3A5	.95	100TH	10.95	720AY	45.00				
3AP1	6.95	VR105	.79	720BY	45.00				
3BP1	3.95	F123A	8.99	720CY	45.00				
3D24	1.95	VR150	.63	720DY	45.00				
3C25	3.95	VT98	39.95	721A	2.40				
3C26	.95	X99	.75						
3C31	3.95	203A	8.95						
3C45	14.50	211	.75						
3DP1A	3.25	217C	6.95						
3E29	8.95	233A	2.95						
3J31	50.00	242C	7.50						
4A1	.95	249C	3.75						
4B30	1.75	250TH	19.25						

350A is a long life WE807

350B is a long life WE6L6G

WE 701A can be used for a Super 813

$10 Minimum Order

THIS MONTH'S SPECIALS AT PRICES NEVER BEFORE

IN STOCK SUBJECT TO PRIOR SALES

ALL NEW PERFECT STANDARD BRANDS

IN LARGE QUANTITIES ONLY

3,000 Magnetrons, Type 725 A at	$6.75
1,000 Magnetrons, Type 730 A at	5.00
2,000 Magnetrons, Type 714 AY at	3.75
1,000 TR Tubes, Type 1822 at	.99
1,000 TR Tubes, Type 1826 at	1.99
50,000 Acorn Tubes, Type 954 at	.19
50,000 Acorn Tubes, Type 957 at	.10
50,000 Acorn Tubes, Type 1625 at	.19
1,000 Klystrons, Type 723 A/B at	7.95
1,000 Rectifiers, Type 1616 at	1.00
1,000 Tubes, Type 814 at	1.95
5,000 Tubes 9001 at	.45¢
5,000 Tubes 9002 at	.29¢
5,000 Tubes 9003 at	.45¢
5,000 Tubes 9004 at	.35¢
5,000 Tubes 9006 at	.20¢
100 Magnetrons 4J38	$55.00
1,000 5D21	$10.00

LIBERTY ELECTRONICS, INC.

PHONE WORTH 4-8262 — 135 LIBERTY ST., NEW YORK 6, N.Y.

NEW YORK'S RADIO TUBE EXCHANGE

TEST EQUIPMENT

Microwave K Band 24000 MC.

TSK1SE Spectrum Analyzer
K Brand Flap Attenuator

X Band

TSX4SE Spectrum Analyzer
TS 12 Unit 1 USWR Measuring Amplifier, 2 channel
TS 12 Unit 2 Plumbing for above TS13

X band Pulsed Signal Generator

TS16AA VSWR Measuring Amplifier. Navy type TS 12 Unit 1
TAA-11BL VSWR Measuring Amplifier. Browning
TS 33 X Band Power and Frequency Meter
TS 35 X Band Pulsed Signal Generator
TS 36 X Band Power Meter
TS 45 X Band Signal Generator
TS 146 X Band Signal Generator
TS 263 Navy Version of TS 146
X Band Magic T Plumbing
X Band Tunable Crystal Mounts
TVN 8SE MIT Klystron pulse and power Supply

S Band

TS155 S Band Signal Generator
TS3A AP S Band Power and Frequency Meter
RF 4 Electrically Tuned S Band Echo Box
BC 1277 60ABQ S Band Pulsed Signal Generator
PE 102 High Power S Band Signal Generator

L Band

Hazeltine 1030 Signal Generator 145 to 235 Megacycles
TS 69, 300 to 1000 MC Frequency Meter
Measurements Corp. type 84 Standard Signal Generator
TS 47, 40 to 400 MC Signal Generator

Broadcast Wave Bands

162C Rider Chanalyst
Short Wave Adapteur for 162C
Ferris 22A, Signal Generator

Oscilloscopes

BC 1287A used in LZ sets
TS 34 Oscilloscopes WE
Supreme 564
Cossor two-beam scope

Audio Frequencies

RCA Audio Chanalyst
Hewlett Packard

Other test Equipment and Meters

TS 15/A Magnet Flux Meter
General Radio V T Voltmeter 728A
Calibrator WE 1-147
Hazeltine Pulse & Sweep Generator
UHF Radio Noise & Field Strength Meter Measurements Corp type 58
General Radio 1000 cycles type 213
Limit Bridges
Boonton Standard Inductances
Weston Meters types 430, 429, 741
Model 40 Pyrometer
Rawson, meters 0-10 Microampere 0-2 Millivolt

Motor Generator type MG 215

Made by Onan & Sons
Input 110 Volt 60 Cycles, 1500 Watt
Output 115 Volt 480 Cycles and 28 Volt DC.
Will operate any Airborne Radar from 110 Volt 60 Cycle Line

RADAR Sets & Parts

APS 3
APS 4
SCR 284
R-111/APR5A Receivers

LIBERTY ELECTRONICS, INC.

PHONE WORTH 4-8262 — 135 LIBERTY ST., NEW YORK 6, N.Y.

Reliance Specials

CAPACITORS

POSTAGE STAMP MICAS

MMF	MMF	MMF	600	MFD
8.2	60	240	620	.0015
10	62	250	680	.0015
15	68	300	680	.002
20	70	350	700	.0026
22	75	370	750	.0027
24	82	390	800	.003
25	90	400	820	.0033
30	100	430	900	.005
39	110	470	910	.007
40	150	500	MFD	.0068
47	160	510	.001	.0075
50	180	600	.0012	.0082
56	200	580	.0013	.01

Price Schedule

8.2	MMF to .001 MFD.	5¢	
.0012 MFD to .002 MFD.	7¢		
.0026 MFD to .0082 MFD.	12¢		
.01 MFD.	15¢		

SILVER MICA

MMF	MMF	MMF	MMF	MFD
10	85	260	488	.0023
24	100	270	500	.0024
30	110	300	510	.0027
39	115	325	525	.003
40	120	330	560	.0033
45	125	380	680	.0039
50	150	370	700	.004
51	180	390	750	.0047
60	200	400	820	.005
62	208	430	MFD	.0051
66	225	450	.001	.006
68	240	466	.0013	.0082
75	250	470	.0022	.01

Price Schedule

10	MMF to .001 MFD.	10¢	
.0012 MFD to .0027 MFD.	20¢		
.003 MFD to .0082 MFD.	50¢		
.01 MFD.	65¢		

OIL FILLED

MFD	V.D.C.	Price
.375	16,000 and	
.75	8,000 (dual)	$6.95
4	10,000	8.95
1	7,500	1.55
1-1	7,000	1.55
.02-.02	7,000	1.50
1	6,000	8.50
2	4,000	6.50
.25	3,000	1.95
.25-.1	2,000	.95
1	2,000	.95
4	1,000	.90
8	1,000	.90
2	1,000	.65
10	600	1.00
4	600	.69
2	600	.39

SELSYNS

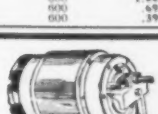
115 V., 60 Cyc.
#C78248
3⅛" dia. x 5⅝" long
$7.95 pair

Mounting Brackets — (Bakelite) for selsyns and differentials shown above ..... 25¢ pair

DIFFERENTIAL

115 V., 60 Cyc.
#C78249
3⅛" dia. x 5⅝" long
$2.25 ea.

Used between two #C78248's as dampener. Can be converted to 3600 RPM Motor in 10 minutes. Conversion sheet supplied. (Converted ..... $3.00)



WW PRECISION RESISTORS, 1% OR BETTER

¼ WATT—25c

6.68Ω	12.32Ω	16.37Ω	123.8Ω	414.3Ω
10.48	13.02	62.54	147.5	705
10.84	13.52	79.81	220.4	2193
11.23	13.89	105.8	301.8	10,000
11.74	14.98		366.6	59,148

½ WATT—25c

250Ω	11.1Ω	210Ω	3,427Ω	8,500Ω
334	18.15	243	4,000	14,525
392	46	260	4,451	15,000
557	52	270	5,000	15,750
927	55.1	298.4	5,900	17,000
76	75	400	6,500	30,000
1.01	97.8	723.1	7,000	100,000
1.53	125	2,500	7,500	
2.04	180	2,850	8,000	

1 WATT—30c

1.01Ω	5.21Ω	1.250Ω	9,000Ω	65,000Ω
2.58	10.9	3,300	18,000	70,000
3.39	270	7,000	55,000	

1 WATT—40c

120,000	128,000Ω	320,000	522,000Ω
125,000	130,000	470,000	600,000
	160,000		700,000

1 Megohm—1 Watt 1%—65c; 5%—40c
100 pieces—10% off; 1,000 pieces—20% off.

HAYDON TIMING MOTORS

1 R.P.M., 115V., 60 Cycle $1.79

POSTAGE STAMP MICA ASSORTMENT

100 asst. regular and silver micas $3.29

10 Conductor shielded cable, 5 ft. long & complete 400 series Jones plug ..... 98¢

#18 SHIELDED WIRE—STRANDED

Single Conductor—100 ft. ..... $1.95 1,000 ft. $12.50
Two Conductor—100 ft. ..... $2.95 1,000 ft. $18.50

PULSE TRANSFORMERS

X 124 T2, UTAH, marked 9262, small gray case. Ratio 1:1:1, hypersil core $1.50

D161310, 50 Kc to 6 Mc, 1⅛" dia. x 1⅞" high. 120 to 9200 ohms $1.50

152-7470—Spec. 10, 111 Chicago Trans. equivalent to 9262 (above) $1.00

D166638 W.E. Permalloy core, Semi-toroidal windings $1.25

KS9960 Ratio, 1:1:1, Z-1, Freq. range 380 to 320 C.P.S. $3.50

D106173, W.E. Freq. resp. 10KC to 2 MC $9.80

900 KVA G.E. K2731, 25000 Volt pk. output; Bifilar, ultr microsecond pulse width $28.50

CARBON MIKE

T-17—Slightly used, guaranteed, 2 ft. cord & PL 68. 69¢

JONES BARRIER STRIPS

Type	Price	Type	Price	Type	Price
2-140Y	$.05	4-141W	$.22	9-141Y	$.47
2-140¾ W	.10	4-141⅜ W	.22	10-141¾ W	.52
2-140¾ W	.13	4-141Y	.22	12-141	.44
4-140	.13	5-141	.26	14-140Y	.56
8-140W	.33	5-141Y	.27	17-141Y	.85
10-140¾ W	.60	5-141¾ W	.27	3-142	.15
15-140	.37	7-141	.27	5-142	.24
2-141	.60	7-141¾ W	.37	6-142	.28
3-141¾ W	.17	7-141Y	.37	10-142¾ W	.64
3-141W	.17	8-141¾ W	.37	2-150	.28
3-141Y	.17	9-141¾ W	.47	4-150	.52

Gear Assortment $6.50
Experimenters dream, 100 pieces, many stainless steel.

CHROMALUX STRIP HEATER—115 V.A.C.

60 Cyc. 750 Watt, curved ..... 95¢

2J1G1 SELSYNS (Brand New)
400 Cyc. Use on 24V. or 110 VAC ..... $2.25 each

FILAMENT TRANSFORMER
Pri.: 115 V., 60 Cyc.—Sec., 5V., 110 A. 6000 volt insulation ..... $9.95 each

FILAMENT TRANSFORMER

Amertran Type WS
For High Voltage Rectifiers
Pri. 115V., 50/60 Cycle.
SEC. 5V., C/T @ 10 Amp.
35 KV R.M.S. Test 12 KV D.C. Operating. Uses 872A Tube or other tubes.
NEW OVERSEAS PACKED
$10.95
872-A Tube $1.98

PRECISION CONTROLS

6 WATT

20,000	Muter	314A	*1.70
20,000Ω	GR	314A	2.50
6,000	De jur	290	1.70
6,000	Muter	314A	1.70
5,000	Muter	314A	2.50
5,000	GR	214A	1.40
2,000	De jur	290	1.70

25 WATT

100K	GR	433A $4.95

4 WATT

500Ω	Centralab	48-501	$.90
50	De jur	292	.75
50	GR	301	1.10
25	GR	301	1.10
20	De jur	292	.75
12	GR	301	1.10

12 WATT

10,000	Muter	471A*	$2.00
10,000Ω	De jur	271T	2.00
5,000	De jur	271T	2.00

7 Terminal Bakelite tie point ..... 35 for $1.00

VERNIER DIAL (From BC-221)

2 ⅝" Dia. 0-100 in 360°. Black with silver marks. Has thumblock ..... 85¢

POWER RHEOSTATS

STANDARD BRANDS

25 WATT Resist.	Shaft		25 WATT 5,000	S.D.*	123Ω	½"	79¢
10Ω	½"	49¢			1,250	½"	89
25	½"	59	50 WATT		2,000	½"	89
145	½"	49			3,500	½"	89
	with switch		8Ω	S.D.* 79¢	150 WATT 8Ω	½"	$1.99
250	½"	59	20	½" 79	*S.D. Screw Driver or Slot		
370	½"	59	90	½" 79¢			

UNIVERSAL JOINT
3/16" hole x 3/8" O.D.
1 1/8" long
Steel or Aluminum
50¢

4AG AMP	Per 100	FUSES AMP	Per 100	4AG AMP	Per 100
1/10	$4.00	1/2	$2.00	2	$2.00
1/4	3.50	1	2.00	5	2.00
1/2	3.50	1	2.00	10	2.50
1	2.00	1	2.00	15	2.50
2	2.00	2	2.00	20	2.50
3	2.00	3	2.00	25	2.50
				30	2.50

MICRO AMMETER 0-500

2" round Basic movt. 500 micro amps. Used—Guaranteed ..... $3.21 ea.

Write for Monthly Bulletin

COAXIAL CABLE
RG 8/U 52 OHM

$55.00 per 1,000 feet

	Ohm	Price per 1,000 ft.		Ohm	Price per 1,000 ft.
RG 5/U	53.5	$70.00	RG 27/U	48	$290.00
RG 7/U	97.5	60.00	RG 29/U	53.5	58.00
RG 8/U	52	55.00	RG 34/U	71	175.00
RG 9/U	51	135.00	RG 39/U	72.5	180.00
RG 10/U	52	125.00	RG 41/U	67.5	575.00
RG 11/U	75	100.00	RG 54/U	58	65.00
RG 12/U	75	190.00	RG 54/AU	58	75.00
RG 13/U	74	125.00	RG 55/AU	53.5	60.00
RG 17/U	52	450.00	RG 57/U	95	100.00
RG 18/U	52	450.00	RG 58/U	53.5	50.00
RG 20/U	52	450.00	RG 59/U	73	40.00
RG 22/U	95	110.00	RG 62/U	93	50.00
RG 24/U	125	240.00	RG 74/U	52	250.00
RG 25/U	48	575.00	RG 77/U	48	100.00

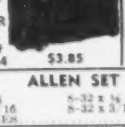
COAXIAL CABLE CONNECTORS

Angle-Adapter	Plug	Socket	Hood
15¢	28¢	28¢	8¢
M-359	PL-259A	SO-239	83-1H
83-1AP	83-1SPN	83-1R	

Adapter for PL 259 A for use on small coax 12¢ each ..... $10.00 per 100

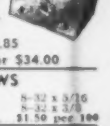
S3-18P	$.25	S3-22SP	.48	UG 59/U	.60
S3-1J	.80	UG 13/U	.60	UG 61/U	.60
S3-1T	1.12	UG 21/U	.60	UG 83/U	.62
S3-1F	1.12	UG 22/U	.60	UG 86/U	1.22
S3-22AP	.85	UG 24/U	.60	UG 87/U	.66
S3-22F	.88	UG 25/U	.60	UG 167/U	2.00
S3-22R	.45	UG 27/U	.60	UG 281/U	.60

0-15A DC AMMETER
BASIC MOVE 12 Ma.
5" x 4" METAL CASE MIRROR SCALE
Lots of 10—$34



$3.85

CHOKE
400 MA
12 Hy.
90 OHM
6,000 V. D. C. TEST



$3.85
10 for $34.00

ALLEN SET SCREWS

4-40 x 3/8	8-32 x 3/8	8-32 x 3/16
4-40 x 3/16	8-32 x 3/16	8-32 x 3/8
ALL SIZES		$1.50 per 100

GLYPTAL CEMENT 1 qt. ..... 75¢

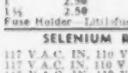
Wrapped—BALL BEARINGS—New

Mfg.	ID	OD	Width	Price
Fafnir 33K5	3/16"	1/2"	5/32"	.25
N.D. 38	5/16	7/8"	9/32"	.45
Fafnir K8A	1/2"	1 1/8"	5/16"	.60
N.D. 5202C-13M	1/2"	1 5/8"	1/2"	1.00
Fafnir 7308W	1 37/64"	3 9/10"	5/16"	2.00
SKF 464430	0"	8"	1"	5.00
SKF170645	3 11/32"	4 1/8"	7/16"	1.50
Fafnir 545	2 1/16"	2 5/8"	15/32"	1.00

NEEDLE BEARINGS

B108 1/2" wide	5/8"	13/16"	30¢
GB34X 1/4" wide	3/16"	11/32"	25¢

SOUND POWERED HANDSET



Brand New! TS-10
Includes 6 ft. cord & spring clips
$6.92 ea. — $17.90 pr.

WALL HANGER — Navy type, for Sound Powered Phones (Shown above) ..... $1.00 each

3AG	FUSES	3AG
⅛ Amp $4.00 per 100	2 Amp	$2.50 per 100
¼ 4.00	3	2.50
½ 4.00	5	2.50
1 2.50	10	3.00
1½ 2.50	15	3.00

Fuse Holder—Littelfuse for 4AG fuse ..... 10¢

SELENIUM RECTIFIERS HALF WAVE

117 V.A.C. IN, 110 V.D.C. OUT @ 75 Ma.	$ .49
117 V.A.C. IN, 110 V.D.C. OUT @ 100 Ma.	.72
117 V.A.C. IN, 110 V.D.C. OUT @ 400 Ma.	1.51

TIME DELAY RELAY

Raytheon CFX 24166 KS 10193-60 Sec.
• 115 V., 60 Cycle • Adj. 50-70 Seconds • 2½ second recycling time—spring return • Micro switch, contact, 10A. • Holds ON as long as power is applied • Fully cased
ONLY $6.50

DELAY NETWORK—ALL 1400Ω

T 113—Approx. 1.2 micro sec. delay	85¢
T 114—Approx. 2.2 micro sec. delay	85¢
T 115 Similar to T 114 with tap brought out	85¢

Minimum Orders $3. ..... All orders f.o.b. PHILA, PA.

RELIANCE MERCHANDIZING CO.

Arch St. Cor. Croskey Phila. 3, Pa. *Telephone Rittenhouse 6-4927*

OUTSTANDING VALUES NOW AVAILABLE

- AMPLIFIERS
- AM CONNECTORS
- CABLE
- CAPACITORS
- CHOKES
- CIRCUIT-BREAKERS
- COAX-CONNECTORS
- COILS
- CORDS
- CRYSTALS
- DELAY LINES
- FILTERS
- FUSES
- HANDSETS
- INVERTERS
- JACKS
- KLYSTRONS
- KNOBS
- MAGNETRONS
- MAGNETS
- MICROPHONES
- METERS
- MOTORS
- POTENTIOMETERS
- POWER PLANTS
- POWER SUPPLIES
- PROJECTION LAMPS
- RECORDERS
- RESISTORS
- SELSYNS
- SCOPE ACCES.
- SHOCK MOUNTS
- SOCKETS
- SWITCHES
- TELEPHONE EQUIP.
- TEST EQUIPMENT
- TRANSFORMERS
- TRANSMITTERS
- TUBES
- WAVEGUIDE
- WAVEMETERS
- WIRE

RADIO HAM SHACK broadcasts its sincere thanks to all its old friends and a hearty welcome to new ones.

TO OUR OLD FRIENDS. It is not news that **RADIO HAM SHACK** is the house of value. They know that our mass purchasing policy of vast quantities of surplus equipment and the maintenance of one of the largest stocks of radio tubes and electronic components in the United States enables us to offer them low, low prices that are difficult to beat anywhere in the world.

TO THE NEW FRIENDS we should like to meet, we extend our services and facilities to bring them the best of equipment at the lowest prices. Deal with us in confidence, secure in the knowledge that our tubes, components and equipment are of standard manufacture, rigidly inspected and securely packed to insure that only first **QUALITY, BRAND NEW MERCHANDISE** reaches you.

Send for our monthly value packed flyer. Your requirements for immediate quotation will receive a prompt reply.

REMINDER—RADIO HAM SHACK is a **BIG BUYER** of tubes, components and equipment. Submit your surplus stock inventory to us for **fast action.** No lot too large—none too small.

WIRE! WRITE! today for latest prices. **SPECIAL DISCOUNTS** for large quantity purchases.

OVERSEAS BROADCAST!! WE SHIP ALL OVER THE WORLD!! SPECIAL HANDLING BY OUR EXPORT DIVISION INSURES SWIFT, CHEAP DELIVERIES TO ALL DESTINATIONS. CORRESPONDENCE IN ALL LANGUAGES. CABLE ADDRESS: HAMSHACK—NEW YORK.

TUBES!! BRAND NEW! STANDARD BRANDS! NO SECONDS! COMPARE! TUBES!!

OA2/VR75	$1.05	2C22	$39.50	227A/5C27	$2.69	816	.99	9006	.15	6B2	$1.67	5Z4	.77	6SN6GT	.97	12BR7	.69
OB2/VR90	.65	2C28	2.19	249C	1.49	826	.39	C1JA	9.95	6Z4	.57	6A8	.62	6SN7GT	.54	12Z3	.69
OC3/VR105	.69	3C24/24G	.35	250R	5.95	828	10.95	C5B	6.95	6J5	.39	6A6LA	1.09	6SQ7	.45	14A4	.79
OD3/VR150	.40	3C30/809	1.89	250TH	18.95	829	7.45	C6A	7.95	1A3	.44	6A6	.79	6SR7GT	.52	14A7	.52
1B21/		3C31/C1B	2.98	250TL	18.95	830B	3.19	C6J	3.45	1A4	1.09	6A7	.69	6SS7	.49	14B6	.67
GL671A	2.87	3C45	12.95	274B	2.69	832A	33.95	C10DD	.98	1A4P	.97	6A8	.75	6ST7	.72	14B7	.69
1B22	2.87	3CP1	1.89	298A	.75	833A	33.95	CK502AX	2.25	1A5GT	.49	6A8GT	.79	6SU7GTY	1.25	14B8	.79
1B23	8.78	3DP1	1.79	304A	2.95	836A	1.97	CK503AX	1.95	1A6	.79	6AC7	.74	6SV7	.79	14H7	.59
1B24	4.59	3DP1-82A	2.79	300B	9.95	837	1.19	CK506AX	2.25	1A7GT	.67	6AD7G	1.09	6T7G	.89	14J7	.87
1B26	2.79	3DP1A	.98	304TH	3.49	838	1.98	CK507AX	2.25	1AB5	.79	6AF6G	.79	6U5/	.65	14N7	.85
1B27	7.98	3EP1	2.59	304TL	1.29	841	.29	CK507AX	1.95	1B3/8016	1.15	6AG5	.69	6U6GT	.63	14Q7	.53
1B30	.79	3EP29	8.95	305A	24.95	843	.29	CK512AX	2.25	1B4	1.19	6AG7	.98	6U7G	.49	14R7	.67
1B32	1.59	3FP7	.97	307A	3.69	845	6.25	CK571AX	8.45	1B5/25S	.89	6AH6	1.29	6V6	.89	19	.49
1B35	3.95	3GP1	5.95	310A	.29	851	12.95	CK1005	.99	1C5GT	.59	6AJ8	.79	6V6GT	.57	24A	.49
1B38	36.50	3HP7	3.95	327A/5C27	2.79	860	14.95	CK1006	.85	1C6	.89	6AK5	.85	6W4	.63	25L6GT	.53
1D21	3.75	4-65A	16.21	331A	12.95	861	9.95	CK1007	.89	1C7G	.89	6AK6	.79	6W7G	.77	25Z5	.44
1N21	.49	4-125A	26.95	350A	1.98	864	.29	E1148	.29	1D5GP	.97	6AL5	.59	6X4	.57	25Z6GT	.45
1N23A	.79	4-250A	36.25	356B	3.98	865	.79	E1F	.89	1D7G	.89	6AQ5	.67	6X5GT	.47	26	.49
1N21B	1.89	4AP10	1.98	368A/8	4.98	866A	1.05	F123A	7.95	1D8GT	.95	6AQ6	.69	6Y6G	.67	27	.42
1N22	.98	4B22	9.98	371B	.49	866JR	1.05	F127A	15.95	1F4	.75	6AR5	.52	6C7G	.98	28D7	.35
1N23	.79	4B24	1.98	388A	.47	869B	26.50	F128A	69.50	1F5G	.75	6AT6	.44	6Y5G	.98	30	.37
1N28A	.79	4B25	7.95	393A	3.69	872A	1.12	F606	37.50	1G4GT	.69	6AU6	.59	7A4/XXL	.49	31	.59
1N23B	1.89	4B26	6.49	394A	3.69	874	.39	F960	49.50	1G6GT	.65	6AV6	.47	7A6	.59	32	.85
1N21	1.29	4B28	2.47	417A	9.98	878	.25	F962A	397.50	1E7G	1.15	6B4G	.89	7A7	.53	32L7GT	.89
1N34	.82	4B32	9.98	446A	1.28	878	1.98	FG17	2.89	1H4G	.55	6B6G	.79	7AG7	.72	33	.49
1P23	2.49	4C35	19.38	446B	1.79	884	1.19	FG27A	6.95	1H5GT	.54	6B7	.87	7B4	.53	34	.37
1P24	.89	4D22	9.98	450TH	19.98	885	1.19	FG32	4.95	1H6GT	.87	6B8G	.69	7B5	.67	35/51	.57
1P28	2.85	4D32	9.98	450TL	16.50	902	3.29	FG33	7.95	1J6G	.75	6B8	.58	7B6	.56	35A5	.63
1R21	1.98	4E27/	5.95	527	5.95	903	2.49	FG57	12.95	1L4	.48	6BE6	.52	7B7	.59	35B5	.55
2AP1	3.89	257B	12.45	550	.98	908	4.98	FG81A	3.29	1LA4	.79	6BF6	.57	7C4	.34	35C5	.59
2C21/RK34	.24	5AP1	2.95	575A	11.95	918	1.49	FG105A	8.95	1LA6	.89	6BG6G	1.42	7C5	.48	35L6	.52
2C22/7193	.98	5AP4	2.95	631P1	3.75	919	1.95	FG172	13.95	1LB4	.89	6BH6	.89	7C7	.59	35W4	.49
2C26A	.18	5BP1	2.29	700A	19.95	923	.79	FG190	12.95	1LC5	.69	6BJ6	.57	7E5	.67	35Y4	.49
2C34/RK34	.22	5BP4	2.39	700B	19.95	927	1.25	GL146	9.95	1LC6	.79	6C4	.19	7E6	.54	35Z3	.57
2C39	17.95	5CP1	1.29	700C	19.95	930	.98	GL434A	2.69	1LD5	.79	6C5	.47	7E7	.62	35Z4	.44
2C40	4.95	5CP7	2.95	700D	19.95	931A	2.95	GL471A	2.85	1LE3	.69	6C6	.57	7F7	.58	35Z5	.59
2C43	7.95	5D21	24.45	701A	3.95	954	.16	GL562	89.50	1L5	.79	6C8G	.69	7H7	.59	36	.67
2C44	.98	5FP7	1.19	702A	2.69	955	.25	GL697	69.50	1LH4	.79	6D6	.44	7K7	.89	37	.35
2C46	9.98	5GP1	2.95	703A	1.89	957	.25	HF100	6.95	1LN5	.67	6D8G	.79	7L7	.69	38	.37
2C51	5.95	5JP1	19.50	704A	1.49	957	.22	HP125A	14.95	1N5GT	.59	6F5	.69	7N7	.67	39/44	.27
2D21	.89	5JP2	8.95	705A	.69	958	.22	HP200	14.95	1P5GT	.67	6F6	.47	7Q7	.59	41	.49
2D26	1.39	5JP4	19.50	706B	18.95	959	.35	HP300	17.45	1Q5GT	.67	6F8	.57	7R7	.69	42	.49
2E22	3.19	5JP7	12.95	706CY	18.75	991/NE16	.24	HY114B	.69	1R4	.59	6F8GT	.57	7T7	.82	43	.49
2E26	3.39	5JP9	12.95	706FY	47.50	1613	.49	HY115	.59	1R5	.69	6F7	.69	7W7	.79	45	.52
2E30	2.39	5JP11	19.50	706GY	47.50	1614	1.35	HY615	.19	1S4	.59	6F8G	.87	7X7	.79	45Z3	.57
2E21A	7.95	5LP1	12.95	707B	14.95	1616	.49	KU610	6.95	1S5	.49	6G6G	.69	7Y4	.47	45Z5	.58
2J22	7.95	5MP1	9.98	708A	3.59	1619	.49	KU627	6.95	1T4	.53	6H6	.39	7Z4	.57	46	.62
2J26	6.98	5NP1	4.98	713A	.79	1624	.67	KC4		1T5GT	.59	6H6GT	.37	12A	.57	47	.69
2J27	12.75	5C21	19.69	714AY	3.59	1625	.19	ML100	37.50	1U4	.59	6J5	.47	12A6	.17	49	.85
2J30	49.50	6F4	5.59	715A	5.49	1626	.25	ML101	49.50	1V	.57	6J5GT	.39	12A7	.59	50	1.39
2J31	8.49	6J4	4.49	715B	6.59	1629	.19	MX408U	.39	2A3	.87	6J6	.77	12A8GT	.49	50A5	.69
2J32	12.95	7BP7	9.95	716C	19.95	1630	.49	RK21	.98	2A4G	1.07	6J7	.67	12AH7GT	.80	50B5	.53
2J33	18.75	9GP7	8.95	717A	.49	1631	.98	RK59	1.69	2A5	.69	6J7GT	.65	12AT6	.44	50L6GT	.52
2J34	16.95	9JP1	6.95	721A	1.98	1632	.98	RK60	.42	2A6	.79	6K6GT	.59	12AT7	.79	50Y6	.57
2J36	97.50	9LP1	19.95	723A/B	12.95	1633	.79	RK65	24.50	2A7	.79	6K8GT	.44	12AU6	.57	53	.87
2J37	12.95	9LP7	1.98	724A/B	2.95	1634	.98	RK72	.59	2V3G	.69	6K7	.49	12AU7	.67	56	.45
2J38	11.95	10HP4	19.69	725A	6.45	1635	1.98	RK73	.59	2X2	.37	6K8	.79	12AV6	.54	57	.45
2J39	19.95	10Y	5.95	726A	6.45	1636	1.98	RK74	2.19	2X2A	.65	6L6GT	.79	12BA6	.55	58	.49
2J40	26.50	12DP7	14.95	726B	29.50	1638	.65	RX120	8.95	3A4	.34	6L6	1.05	12BE6	.49	59	.89
2J46	49.50	12GP7	12.75	726C	49.50	1644	.98	V70D	2.45	3A5	.79	6L6G	.99	12C8	.54	70L7	.99
2J48	7.95	12HP7	12.95	730A	2.45	1654	.25	VC1138	5.95	3A8	1.59	6L6GA	.85	12F5GT	.58	71A	.49
2J49	19.50	12LP4	24.95	750TL	69.50	1665	1.10	VR53	.19	3B7/1291	.29	6L7	.79	12H6	.27	75	.53
2J50	22.50	15E	1.19	800	1.49	1851	.69	VR78	.29	3D6/1299	.29	6L7G	.87	12J5GT	.34	76	.44
2J54B	22.50	15R	.49	801A	.19	1960	.19	VT127A	.19	3LF4	.79	6N7	.87	12J7GT	.87	77	.43
2J61	69.50	15AP4	49.50	802	4.19	2050	1.19	VT198	.29	3Q4	.44	6N7GT	.52	12K7GT	.52	78	.44
2J61	34.50	19T8	.59	803	2.95	2051	.39	VU111	.49	3Q5GT	.67	6R7	.79	12K8	.59	80	.37
2J62	34.50	23D4	.29	804	7.95	5005	4.25	WL468	5.95	3S4	.57	6S7G	.79	12Q7	.49	81	1.25
2K25	22.50	28D7	.29	805	3.65	5011	.59	WL531	4.75	3V4	.67	6S8GT	.57	12SA7	.57	82	.84
2K28	24.95	304TH	.79	807	1.09	5012	1.39	WL532	1.89	5B4GY	1.09	6SA7	.44	12SC7	.54	83	.75
2K29	24.50	35TG	5.95	808	.99	5013	1.39	WL616	37.50	5T4	.87	6SD7GT	.44	12SF5	.59	83V	.89
3AP1	4.55	45SP	.19	809/3C30	1.89	5014	22.50	WL617	18.95	5U4G	.49	6SF5	.49	12SF7	.54	84/6Z4	.56
3B22	4.95	50A	5.95	810	2.95	5020	.59	WL619	34.50	5V4G	.87	6SF7	.59	12SH7	.47	85	.69
3B24	1.49	75TL	5.95	811	1.98	5025	3.69	WL677	34.50	5W4	.67	6SG7	.59	12SH7	.35	89Y	.35
3B25	4.87	100R	.97	812	2.45	9001	.52	WL681/		5X4G	.57	6SH7	.37	12SJ7	.47	117L7/M7	1.19
3B26	1.49	100TH	5.95	812H	6.56	9002	.25	686	22.50	5Y3G	.39	6SH7	.47	12SK7	.57	117N7	1.19
3B27	1.95	100TH	2.25	813	6.55	9003	.33	WL710A	.25	5Y3GT	.39	6SJ7	.47	12SL7	.59	117P7	1.19
3B28	7.95	211	.25	814	1.98	9004	.24	OA2	1.29	5Y4G	.49	6SK7GT	.44	12SN7	.52	117Z3	.49
3BP1	2.39	217C	9.95	815	1.59	9005	1.35	OA4G	.89	5Z3	.52	6SL7GT	.59	12SQ7	.49	117Z6	.65

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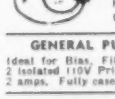

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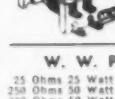

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2.5V CT 20A, 2.5V CT 20A 6.95

CHOKE BARGAINS

6 Henry 50 ma 300 ohms ..... 3 for $0.99
8 Henry 150 ma 140 ohms ..... .99
1.5 Henry 250 ma 72 ohms ..... .59
8 Hy. 400 MA 97 Ohms $3.95

HEAVY DUTY RHEOSTAT

25 Ohms, 675 Watts Max. with Knob and Hardware $3.95

10 for $29.50

FILAMENT TRANSFORMER

6.3 volts at 12 amps. Primary 110 volts 60 cy. Size 3¼"H x 2⅞"W x 3"D. WT 3½ lbs. As Illustrated. While they last ..... $1.69 ea.

SENSITIVE RELAY

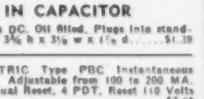
Breaks at 3 MA. Beautifully Constructed and delicately pivoted. Approx. 2000 ohms resistance. Housed in dustproof aluminum can. Plugs into 5 prong socket. Only ..... .99 ea.

PLUG IN CAPACITOR

8 x 8 Mfd 600 volts DC. Oil filled. Plugs into standard 4 prong socket. 3¾ h x 3½ w x 1⅞ d $1.39

GENERAL ELECTRIC Type PBC Instantaneous Overcurrent Relay. Adjustable from 100 to 200 MA. Electrical and Manual Reset, 4 PDT, Reset 110 Volts 60 Cycles $7.95

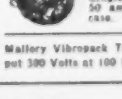
BAKELITE CASED MICA



MMF	VDC	Price	MMF	VDC	Price
D .001	600	$ .18	C .001	3KV	.90
E .01	600	.26	C .002	3 KV	.95
D .02	600	.26	D .005	3 KV	.70
E .027	600	.26	C .005	3 KV	1.24
C .01	1 KV	.45	C .006	3 KV	1.50
C .056	1 KV	.50	D .002	3 KV	.70
C .07	1 KV	.55	C .001	5 KV	.70
D .02	1200	.35	C .0005	5 KV	.85
C .024	1500	.65	C .0015	5 KV	1.60
C .033	1000	.75	C .003	5 KV	1.90
C .015	2 KV	.80	C .005	5 KV	2.50
C .02	2 KV	.90	C .002	6 KV	2.90
D .002	2500	.45	B .007	5 KV	2.75
E .005	2500	.55	B .0015	8 KV	2.90
E .025	2500	1.25	B .002	12 KV	6.50

MOSSMAN SWITCHES

4 Pole Single Throw ... $1.10
3 PDT, plus 6 PST 1.75



Heavy Duty Tap-Switch Ohmite Model 412

Single Pole 6 Positions, Non-Shorting 50 amp. contacts. Vitreous Enamel case. List $16.00 ..... Only $2.95

Mallory Vibropack Transformers 6 Volt Input. Output 300 Volts at 100 MA. ..... $2.95 ea.

Tremendous stocks on hand. Please send requests for quotas. Special quantity discounts. Price f.o.b. N. Y. 20% with order unless rated, balance C. O. D. Minimum order $5.00.

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188 Washington St., New York 7, N. Y.

Phone CO 7—6486
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DEPARTMENT EA

Latest WELLS Tube Price List

Many Types Are Now Scarce At These Low Prices. Check your requirements at once for your own protection. All tubes are standard brand, new in original cartons, and guaranteed by Wells. Order directly from this ad or through your local Parts Jobber.

TYPE	PRICE EA.
0A4G	.95
0A5	.45
E1-C1A	3.95
1A3	.90
1A5GT	.95
C1R, 3C31	4.85
1B4P	1.75
1B24A, 6147A	2.55
1B32	3.40
1B35	7.50
1B32, 532A	1.85
1B42	5.25
1B46	9.90
F1-IC	4.85
1C5GT	.65
1C6	.75
1C7G	.85
1D8GT	.95
1E7GT	1.95
1F4	.90
1G6	.68
1H4G	.89
1H5G	.80
1L4	.50
1LC6	.75
1LD5	.85
1N5GT	.75
1P24	2.50
1Q5GT	.85
1R4	.55
1S5	.70
1T4	.75
2A3	1.65
2A7	.75
2AF3	4.75
2B7	.75
2B22, 5106B	3.25
2C22, 7193	.35
2C26	.90
2C26A	.40
2C34	.40
2C44	1.25
2J21	10.45
2J21A	11.45
2J22	9.85
2J26	8.45
2J27	12.95
2J31	9.95
2J32	12.85
2J33	18.95
2J34	17.50
2J37	13.85
2J38	6.95
2J46	12.95
2J51	24.50
2J52	14.95
2X2	.55
2Y3G	1.20
3A4	.95
3A4, 47	.45
3B7	.45
3B22	2.35
3B24	1.75
3B31	3.75
E1-3C	3.95
3C21	5.00
3C24, 24G	.50
3C31-C1R	4.85
3CP1-S1	1.95
3D21	3.35
3D5, 1299	.45
3F7	1.85
3F7A	4.95
3G1	4.50
3H17	1.00
3HP7	2.95
3Q5	.90
3Q5GT	.90
3S4	.75
6A4	2.00
3S15	14.95
VT6, 215A	1.20
5AP1	3.95
E1-C5B	4.25
5BP1	2.75
5BP4	3.95
5CP1	3.75
5D21	24.75
5FP7	2.75
5GP1	2.75
5JP4	4.75
5J23	14.25

TYPE	PRICE EA.
5J29	13.45
5V4G	1.07
5Y4	.78
5Z3	.80
5Z3G	.75
6-4	.38
6-7	.35
E1-C6A	2.00
6A3	.80
6A6	.65
6A8	.95
6A7	.90
6AF6G	.85
6AG5	1.20
6AJ6	1.10
6AK5	1.20
6AK6	.80
6AL5	1.20
6AL6	.95
6AL7	.95
6AQ5	.81
6AV6	.81
6B4G	.95
6B7	.75
6B8	.95
6B8G	.95
6BA6	.95
6BE6	.65
6C4	.40
6C8G	1.05
6C21	19.25
6D6	.50
6F5	.85
6F6	.90
6F6G	.90
6F8G	.95
6G6G	.80
6J5	.45
6J6	.90
6J7G	.70
6J8G	.95
6K6GT	.55
6K7	.80
6K7G	.80
6L6G	1.35
6L7	.75
6N7	.75
6N7-GT	.75
6Q7	.85
6Q7G	.75
6S4	.65
6S7	.75
6S7GT	.70
6SF7	.80
6SF5	.65
6S7	.65
6S07	.40
6S07GT	.40
6S37	.90
6S37GT	.90
6S87	.90
6S87GT	.90
6S87GT	.90
6S97	.90
6S97GT	.90
6S07	.90
6S07GT	.90
6S87	.90
6U7G	.85
6V6GT	.75
6W6G	.80
6X5GT	.73
6Y6G	.95
7-7-11	.35
7A8, XXL	.90
7A5	.80
7A6	.75
7A7	.90
7B4	.90
7B6	.80
7B8	.90
7B07	4.95
7C4, 1203A	.35
7C5	.65
7C7	.95
7D5, 1201	.90
7E5	.90
7F7	.70
7H7	.70
7J7	.70
7N7	.70
7Q7	.90

TYPE	PRICE EA.
714	.90
9-3	.45
10	.55
10 AC08N	.95
10 (VT-25A)	.55
10E, 146	1.00
10Y1	.90
10Y (VT-25)	.45
12A6	.25
12AH6T	.28
12A7	.80
12AH7GT	1.12
12AU7	.95
12AX7	1.20
12BD6	1.20
12C8	.50
12F5GT	.65
12H6	.40
12J5GT	.40
12J7GT	.70
12K8	.68
12Q7GT	.75
12R4	.73
12SC7	.75
12SF7	.60
12SG7	.68
12SH7	.40
12SJ7	.73
12SK7	.60
12SK7GT	.60
12SJ7GT	.60
12SR7	.60
12SR7	.60
12SR25-2AMP. TUNG.	1.95
12Z3	.90
13-4	.35
14A7	.90
14B6	.75
14F7	.90
14H7	.90
14Q7	.90
14R7	.90
15E	1.50
15R	1.20
16(879-2AMP. TUNG.	1.95
16Z7, 907	3.25
19	1.20
20-4 BALLAST.	.45
21-2 BALLAST.	.45
22E21	2.75
23D4	.45
25Z4	1.75
25A5	.75
25Z5, 80Z	2.85
VT-25-5/10	.55
25Z5	.72
25Z6GT	.55
25Z6G	.55
26	.90
27	.90
28D7	.40
30, VT-67	.75
30 (NOT VT-67)	.75
33	.75
34	.35
6L34	1.50
RK34, 2C34	.45
35, 51	.60
35L6GT	.73
35W4	.73
35Z5GT	.62
36	.40
37	.40
38	.40
39, 44	.35
41	.55
42	.50
43	.50
45 SPEC.	.50
46	.75
E250	.45
1B50	1.00
5Q8S	1.00
5Q10GT	.95
50	.65
57	.45
58	.50
RK60, 1041	.65
VT62 (BRITISH)	1.10
65	1.25

TYPE	PRICE EA.
6984	.90
VT67/30	.90
7D17	1.05
71A	.75
CE272	1.50
CRP72	.95
CY872	1.75
RK872	.90
RK873	1.25
75	.89
76	.55
77	.55
78	.50
VR78	.65
80	.45
FG-81-A	3.95
83V	.90
89	.73
89T	.40
VR90	.65
VT90 (BRITISH)	2.55
VR92	.65
FG95, DG1295	6.95
VT98, RE15	14.95
100B	2.75
100TH	11.50
101, 837	1.65
102F	3.55
FG105	9.75
VR105	.85
V1-111-S	.50
114B	1.20
121A	2.65
122A	2.65
VT127 (BRITISH)	.35
VT127A	2.95
VR150	.50
VT158 (HK)	14.95
FG172	19.75
205B	1.45
211 (VT-4-C)	.90
215A (VT5)	1.20
CEP220	2.00
221A	1.75
227A	4.75
231D	1.20
RK233A	1.95
250B	6.00
257A	3.00
259A	2.95
262B	4.25
287A, 722A	9.50
304TL	1.75
304TH	5.75
307A	4.25
310A	.55
327A	2.50
350B	2.55
354C	14.95
350B	4.95
398AS, 703A	3.95
371A, VT62	.95
371B	.85
388A	3.95
393A	4.65
398A	4.95
MX408U-BALLAST.	.30
417A	14.50
434A	3.40
446A	1.55
446B	1.55
450TH	17.95
GL451	1.90
GL471A	2.55
8S501	3.00
527	9.95
W1530	5.00
W1531	12.95
W1532	1.85
532A, 1B32	3.55
61B50	3.75
RK616	2.45
RK615	1.05
W1632A	8.75
700	7.95
700B	7.95
700C	7.95
700D	7.95
701A	3.00
702A	2.95
703A, 398AS	3.95
704A	1.75

TYPE	PRICE EA.
706A	1.55
706AY	17.50
707A	14.00
707B	15.00
708A	3.75
709A	4.75
710A	2.45
713A	1.50
714AY	3.75
715B	9.75
717A	.85
718BY	18.00
718EY	15.00
721A	3.75
721B	3.95
722A, 287A	9.50
723AB	14.95
724A	4.25
725A	9.95
726A	12.50
726B	13.50
730A	9.95
801	.50
801A	.70
803	5.25
804	8.95
805	6.95
807	1.25
808	1.65
809	2.50
812	2.95
813	7.85
814	3.75
815	2.85
826	.75
830B	3.95
832A	7.95
834	5.75
835, 3B111A	1.10
836	1.35
837	1.65
838	3.25
841	.50
842	2.75
843	.50
851	30.00
852	5.25
861	29.45
864	.45
865	2.55
866-JUNIOR	.55
866A	1.30
866	19.75
866B	27.25
872A	2.45
874	1.95
876	.50
878	1.95
879, 2X2	1.95
902	3.50
923 (P6070)	1.35
930	1.00
931A	3.95
954	.35

TYPE	PRICE EA.
955	.55
956	.55
957	.45
958	.55
958A	.55
959	.56
991, FG17	3.25
991, NE-16	.24
1005	.35
1007	4.50
1148	.35
1201	.45
1203	.56
1203A	.66
1284	.55
DG1295	9.95
1299, 3D5	.45
1613-SELECT. 6F6	.55
1616	1.25
1619	.35
1624	1.25
1625	.35
1626	.35
1629	.35
1630	3.95
1636	.90
1641, RK60	.65
1642	.50
1852, 6AC7	.90
1853, 6AB7	.95
1860	1.35
1861, 532A	1.85
2050	.78
2051	.75
(X995)	1.20
7193	.35
8011, VT90-BRITISH	2.55
8012	3.25
8013	1.25
8013A	1.50
8019	1.75
8020	3.25
8025	6.75
8001	.66
8002	.95
8003	.60
8004	.40
8005	.40
3B111A, 835	1.10

XTAL DIODES

1N21	.65
1N21A	.95
1N21B	1.20
1N22	.80
1N23	.80
1N23A	.85
1N27	.95
1N29	.85
1N51 (GE)	.75
1N48 (GE)	.75
1N52 (GE)	1.00

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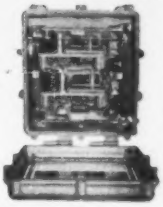
BROWN TELEPLOTTER RECEIVER



Model 791X1R

115 volt 60 cycles

Contains a pen driven by two balancing motors which writes on rear of a translucent chart. Pen arm position is in terms of two co-ordinates supplied balancing motors thru two amplifiers. Originally intended for recording plotted or written data from central plotting board. Writes at one half scale on 18 in. chart. Discriminator input circuit designed to operate unit as function of two varying R.F. frequencies varying about mean of approx. 430 KC. Further data on request. (Shipping weight 435 lbs.)

Price $375.00

LP-21-LM Compass Loops

Motor driven loop enclosed in graphitized zeppelin housing. Includes Autosyn transmitter. Stock #SA99.

$14.50 each

G.E. Servo Amplifier—2CV1C1 Aircraft amplidyne control amplifier. 115 volt 400 cycles. Two channel. Uses 2 6SN7GT and 4 6V6GT tubes. Supplied less tubes. Stock #SA-168. **Price $9.50 each.**

D.C. MOTORS

Universal Electric W.E. KS-5603-1-02, 28 v. d-c 0.6 amps. 1/100 hp. 4 lead shunt. Stock #SA-215. **Price $3.75 each.**

12 V.D.C. Motor John Oster B-9-2

1.4 amps.

5600 rpm.

1¾" Diam x 3¾" Lg. Spline shaft. C.W. rotation. Stock #SA-46. **Price $1.95 each**

DELCO CONSTANT SPEED MOTOR A-7155

1/20 hp. 27.5 v d-c 3600 rpm. Cont. duty. 2¼" diam. x 5⅛" lg. ⅜" shaft extension, 5/32" diam. 4 hole base mounting. Stock #SA-94. **Price $4.75.**

Delco 5069S Constant Speed DC Motor, 27 v. d-c 120 rpm. Governor controlled. Stock #SA-249. **Price $5.95 each.**

General Electric 2 RPM Motor. Type 5BA10FJ228. 27 v. d-c @ 0.6 amps. 10 lb/in torque at 2 rpm. Shunt wound. D-C noise filter. Stock #SA-274. **Price $6.75 each.**

Synchron 10 RPM D.C. Timing Motor—24 V. Hanson Mfg. Co. Stock #SA-110. **Price $3.75 each.**

General Electric Type 5BA10AJ52C 145 rpm. 27.5 volt D-C motor. 0.65 amps. 14 in./oz. torque. Shunt wound four lead reversible. Stock #SA-218. **Price $4.75 each.**

D-C ALNICO FIELD MOTORS

Delco 5069456, 27.5 volts, 10,000 rpm. 1" x 1" x 2" lg. Stock #SA-236. **Price $6.75 each.**

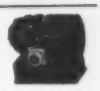
Other models also available

MICROWAVE ANTENNA

AS-217-APG 15B, 12 Cm dipole and 13 inch Parabola housed in weatherproof Radome 16" dia. 24 v. DC spinner motor for conic scan. Stock #SA-95. Shipping wt. 70 lbs.

Price $6.95 ea.

INVERTER SPECIALS 400 Cycles



Pioneer Type 12128-1-B. 27.5 volts D-C input. 26 volts 400 cycle 1 phase out. 6.0 V.A. (Current manufacture) Prices on Request

General Electric 5D21NJ3A — Input 28 volts DC at 35 amps. Output 110 volts 400 cycles. 485 V.A. at 0.90 P.F. Weight 15 lbs. Stock #SA-41. **Price $12.50 each**

General Electric 5AS13NJ3 — Input 26 volts DC at 160 amps. Output 115 volts 400 cycles. 1500 V.A. 0.8 PF. Stock #SA-286. **Price $19.50 each**

SYNCHROS

Navy Types

1G, 1F, 1CT, 5G, 5F, 5CT, 5DG, 5HCT, 5SF, 5HSF, 5SDG, 6DG, 5G, 6DG, 7G, etc.

Prices on Request

SERVO AMPLIFIER

Minneapolis Honeywell 115 v. 400 cycle unit. For use with SA-268. Model G403ATCA3. Designed for use with A-C error signal from bridge circuit. Stock #SA-269A. **Price $8.50.**

MOTOR SPECIALS

G.E. 5BA25AJ31A and 32A. Dual field reversible gear head shunt wound. 24 v. @ 2.9 amps. 9 rpm. 10 min. time rating. Aircraft type. Magnetic brake. Stock #SA-295. **Special Price $19.50 each.**

G.E. 5PS56HC1A — Split field series reversible motor. 60 v. d-c at 1.4 amperes. 5500 rpm. 3" diam. x 5" lg. Ideal for servo applications. Stock #SA-273. **Price $8.75 each.**

OSTER PM MOTOR

Alinco Field

27.5 v. d-c. Can also be used as rate generator. #SA-281. **$3.75 each**

Gyro and Housing Mirror Assembly. For K-14A sighting head. Gyro stabilized mirror assembly. Stock #SA-294. **Price $9.75 each.**

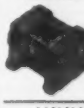
AC-SERVO MOTORS

Pioneer Type CK-2. 26 v. 400 cycles fixed phase, var. phase 49 v. max. 40:1 gear reduction. Stock #SA-87A. **Price $6.50 each.** Also available less gear train. **Price $4.25 each.** Stock #SA-97.

PIONEER CK-17

400 cycle 2 phase, 26 v. fixed phase. 45 v. max. variable phase. Built in gear reduction. Output shaft speed approx. 4 rpm. Stock #SA-287. **Price $12.50.**

FORD SERVO MOTOR



115 volt 60 cycle two phase low inertia motor. 18 watts output. BuOrd. 207927. Stock #SA-291. **Price $49.50 each.**

MINNEAPOLIS-HONEYWELL

Type G303AY2CA4 Servo Motor

115 v. 400 cycles. Built in gear reduction. 50 in/lb torque. Stock #SA-268. **Price $6.75 each.**

SAWTOOTH POTENTIOMETER

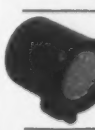
W.E. KS-15138

Type RL-B-R. 100 ohm element. Non linear ring gives linear output with CRT deflection coil load. Cont. rotation. 2 brushes 180 degrees opposed. 2 taps 180 degrees opposed. Stock #SA-288. **Price $5.50 each.**

400 Cycle Generators Homelite 18A120D28-1 400 cycle out at 1 phase 115 v. 39 amps. Also a d-c output of 28 v. and 17.9 amps. **Special at $175.00 each.**

G. E. 5ASB31JJ3. 400 cycles out at 115 volts 7.2 amps. Ideal for lab. 6" lg. x 6" diam. 8000 rpm. Stock #SA-292. **Price $79.50 ea.**

PRECISION AUTOSYN Pioneer Type AY-150 Control Autosyn. Precision type. 26 v. 400 cycle. Stock #SA-297. **Special low price $14.50 each.**



A-5 Autopilot Indicator Autosyn Type Pilot Indicator for A-5 Autopilot. 26 v. 400 cycles. Stock #SA-229. **Price $12.50 each.**

ANTENNA TILT INDICATOR D-C Selsyn type tilt indicator G.E. 5DJ29AAK. 24 volt. Stock #SA-296. **Price $2.75 each.**

Prices F.O.B. Paterson
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4 Godwin Ave. Pater ... N. J.

SPECIALISTS IN FRACTIONAL HORSE POWER MOTOR SPEED CONTROL

LAVOIE FREQ. METER MICRO-WAVE

375 to 725 MCS

Model TS-127/U is a compact, self-contained, precision 1/2 of 1 MC frequency meter which provides quick, accurate readings. Requires a standard 1.5V "A" and 45V "B" battery. Has 0-15 minute time switch. Contains sturdily constructed 111 "Q" resonator with average "Q" of 2000 working directly into detector tube. Uses 957, 1A6 and 3S4 Tubes. Complete, new with inst. book, probe and spare kit of tubes. Less batteries.
Write for descriptive circular. **$49.50**

THERMOSTATIC TIME DELAY RELAY

Amperite type 115 No.—45 Heater voltage 115V. Normally open SPST contacts, 45 sec. delay. Contact rating 115V 3A. A.C. (or 440V, A.C. 2A) max. voltage on contacts—1000 max. voltage bet. contacts and heater—1500. Size 3 9/32 x 1¾" overall.
Made for U. S. Navy..... **$1.10**

High Voltage Capacitors Oil Filled

.25 MFD., 20KV	$15.75
.5 MFD., 25 KV	$23.50
1 MFD., 15KV	$16.50
1 MFD., 7.5KV	$4.95

All brand new. Made by prominent manufacturers.

● TUBE SPECIALS ●

1B24	$3.75	700A	$19.50
2J38	$7.50	700GY	$18.50
2J41	$12.50	721A	$3.95
2J49	$19.50	725A	$8.50
2J62	$35.00	7HP7	$4.25
3BP1	$2.00	814	$3.50
3B28	$2.00	832	$ 40
3D21	$1.45	861	$10.00
3FP1	$2.60	8020	$1.25
3J45	$10.00	8025	$3.00
3JP1A	$1.00	9LP7	$3.95
4C35	$17.50	WE304A	$3.95
5BP7	$1.25	WL531	$6.75
		C6J	$2.00

LINEAR SAWTOOTH POTENTIOMETER

No. KS 15138

Has continuous resistance winding to which 24 volts D.C. is fed to two fixed taps 180° apart. Two rotating brushes 180° apart take off linear sawtooth wave voltage at output. Size approximately 3¾" dia. x 3" deep x 4⅝" long. Enclosed in die cast 4008 Frame with AN connector socket.

$5.50
Brand New

U. S. NAVY SOUND POWERED BATTLE PHONES

Western Electric No. D173312. Type G. Combination headset and chest microphone as illustrated. Brand new, including 20 ft. of rubber covered cable **$17.50**

Automatic Elec. Co. No. GL44AD. Similar to above but including Throat microphone in addition to chest microphone. Brand new with 20 ft. rubber covered cable **$13.50**

SYNCHRO GENERATORS

Brand new—Gov't. sealed and inspected. Packed in oversea case. Synchro Transmitters 115 V., 60 cy., 3 ph. Size 5" dia. Precision accuracy made for gun fire control. Cost Gov't. $80.00 each. Wgt. 3 lbs. Dimensions 4¾"L x 4¾"L x 3¾"H.
Brand New Per Pair **$14.75**

Differential Synchros

36-50 volts, 400 cycles. Brand new in sealed containers. Ford Inst. Co. type 5B102. Brand new **$12.50**

MICROWAVE RECEIVERS

APR-1, APR-4, APR-5A.

Tuning Units for APR-1 or APR-4. TN-16 (38-95 mc). TN-17 (74-320 mc). TN-18 (300-1000 mc.) These front units may be used with any 30 mc. IF amplifier or as converters into receivers tuned to 30 mc.)

MODEL AN/APA-10 PANORAMIC ADAPTER

Provides 4 Types of Presentation:
(1) Panoramis (2) Aural
(3) Oscillographic (4) Oscillosocopic

Designed for use with receiving equipment AN/ARR-7, AN/ARR-5, AN/APR-4, SCR-587 or any receiver with I.F. of 455kc, 5.2mc, or 30mc. With 21 tubes including 3" scope tube. Converted for operation on 115 V. 60 cycle source.
Includes 60 page T. M. **$195.00**

MOTOR GENERATORS DYNAMOTORS, INVERTERS, ETC.

2.5 KVA MG SET. Diehl Elec. Co. 120V DC to 120V AC, 60 cy., 1 Ph. Complete with Magnetic Controller. 2 Field Rheos and Full Set of Spare Parts including Spare Armatures for Generator and Motor.
Full specs. on request. New $185.00

2 KVA MG SET. O'Keefe and Merritt. 115V DC to 120V AC, 50 cy. Idles as 3 Ph. synco motor on 208V, 50 cy. New. Export crated. **$165.00**

1.25 KVA MG SET. Allis Chalmers. 115V DC to 120V AC, 60 cy., 1 Ph. Fully enclosed. Splashproof. Ball Bearings. Centrifugal Starter. New $97.50

Same machine but for 230V DC operation. $110.00

Spare Parts for either machine. $15.00

MG SET FOR NAVY TBS TRANSMITTER. Type CG 21302.
440V AC, 60 cy., 3 Ph., 1500VA to 875V DC and 200V DC. New $45.00

DYNAMOTOR. Navy Type CAJO-211444. 105/130V DC to 13V DC at 40A or 26V DC at 20A. Radio filtered. Complete with Line Switch. New $69.50

DYNAMOTOR. Elect. 32V DC to 110V AC, 60 cy., 1 Ph., 2.94 Amps. New $24.50

DYNAMOTOR. Elect. 32V DC to 110V AC, 60 cy., 1 Ph., 0.43 Amps. New $17.50

MISCELLANEOUS SMALL MOTORS INVERTERS, AMPLIDYNES

AMPLIDYNE—G. E. Model 5AM21NJ9A. 230 Watts. 1760 R.P.M. Input: 27V. DC. Output: 60V. DC. Weight 34¾ lbs. New $10.50

AMPLIDYNE—G. E. Model 5AM21J17. 4000 R.P.M. Motor Compound wound. 150 Watts. Input: 27V. DC. Output: 60V. DC Sig. Corp. U. S. Army MG-27-B. New $16.50

INVERTER. Leland Elec. Co. Model 1FJ206A. Input: 28V. DC, 35 Amps. Output: 80V., 800 cy. 485 VA. New $12.50

INVERTER—G. E. Model 5D22NJ3A. Input: 24V. DC. Output: 115V. 400 cy. 460 VA. New $12.50

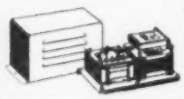
INVERTER. Bendix Pioneer. Type 12121 A. 24V DC to 115V AC. 400 cy. 3 Ph. 250 VA. New $89.50

D.C. MOTOR—G. E. Model 5BA 50LJ2A. 0.5 HP. Armature: 27V. at 8.3 Amps. Field: 60V. at 2.2 Amps. R.P.M. 400. New $12.50

DYNAMOTOR. Type PE-86. For use with SCR522 Transmitter-Receiver. Brand new in export crates $9.50

LINE VOLTAGE STABILIZERS

RAYTHEON—Navy Type, CBP-301407. Input: 95-125V, 57/65 CPS., 1 PH Output: 115V, 0.82 KVA, 1% Reg., 0.96 PF. Weight 285 lbs. Overall size—30" high x 20" wide x 12½" deep. Enclosed in Navy Grey Ventilated Cabinet for Wall Mounting.
Brand New **$69.50**



RAYTHEON Adj. input taps 95-130V., 60 cy., 1 Ph. Output: 115V., 60 Watts. ⅓ of 1% Reg. Wt. 20 lbs. 6⅛" H x 8¼" L x 4¾" W. Overload protected. Sturdily constructed. Tropicalized.
Special **$12.50**

400 CYCLE TRANSFORMERS

AUTO. 400 cy. G.E. Cat. No. 80G184. KVA .94-8—520#. Volts 460/345/230/115. New $3.45

FILAMENT. 400/2600 cy. Input: 0-75-80-85-105-115-125V. Output: 5V2A/5V3A/5V3A/5V2A/5V6A/5V6A/6.3V6A/6.3V5A. New $1.95

THYRATRON POWER. 400/1600 cy. Raytheon UX-8876. 400/1600 cy. Pri: 115V, Sec: 50-0-50V at 0.5A, 6.3V at 1.2A. Test r.m.s. 1780. New $2.75

PLATE. WECO KS9550. 400/800 cy. Pri: 115V. Sec: 1350-0-1350 at .057A (2700V Total). Electat shilded. Wt. 2.3 lbs. New $2.95

SCOPE PL. & FIL. WECO 9556. 400/2400 cy. Pri: 115 HV Wdg. 112V at .008A. Fil. Wdgs. 6.4V4A, 2.5V1.75A, 6.4V 6A. Elecstat shilded. Wt. 1.4 lbs. New $2.75

FILAMENT. 400/2400 cps. WECO KS9553. Pri: 115V, Sec: 8.2V1.25A/6.35V1.5A. Elecstat shilded. Wt. 0.5 lbs. New $1.65

PLATE & FIL. 400/2600 cy. Pri: 0-90-115V. Sec#1—1200VCT at 1.75MA. Sec#2—6.3V/CT at 130MA. Pri Secs.: 6.4V4.3A/6.35VO.8A (ins.1500V)/5V2A/5V2A $3.95

RETARD. 400cy. WECO KS9598. 4 Henry 100MA $1.00

400 CY. SERVO TRANSFORMERS

G.E. #8SG665X. Pri: 57.5V. Sec.#1—28.75V. Sec.#2—28.75V $1.50

G.E. #8SG666X. Pri: 57.5V. Sec: 115V C.T. $1.50

G.E. #8SG667 Pri: 220V C.T. Sec: 220V C.T. $1.50

G.E. #8SG668X. Pri: 115V. Sec: 275V/270V/275V/275V/230V/230V/6.3V c/T/ 6.3V CT $1.50

60 CYCLE TRANS

1.5 KVA STEPDOWN. G.E. Cat. No. 76G173. Pri: 115/230V Sec: 23/11.5V. Either high voltage connection may be used with either low voltage connection $23.95

50KVA STEPDOWN. Standard Trans Corp. Oil trans type MD. Pri: 450V/11A. Sec: 115V/427A. Navy type. Ambient temp. 50 Deg. C $125.00

FILAMENT. Raytheon Hypersil Core. Pri: 115V. Sec: 6.3V22A/6.3V2.4A/6.3V2.25A/6.3VO.4A Ins. for 1700V $3.95

FILAMENT. Kenyon. For 866 tubes. Pri: 115V Sec: 2.5VCT at 10A. Insulation 10,000V $2.95

SPECIAL TRANS

PULSE. Utah No. 9350. ..... $1.25

PULSE. WECO KS-9563. Supplies voltage peaks of 3500V from 807 tube. Tested at 2000 Pulses/sec and 5000V peak. Wdg. 1-18 ohms. Wdg. 2-0.72 ohms. L of Wdg. 1-3.6 .073-.082H at 100 cps. $5.50

BLOCKING OSC. Westinghouse #132AWP $4.95

12 and 24 Volt POWER KIT

Consists of Power Trans. and full wave bridge selenium rectifier. Input: 115-230 A.C. Output: 12-24V D.C. at 1.1 amps. Fine for operating relays, small motors, dynamotors, or for low voltage D.C. source in laboratories, etc.
Brand New **$7.95**

SWEEP GENERATOR CAPACITOR

High speed ball bearings. Split stator, silver plated, coaxial type. 5-710 mmfd. Brand new.
$1.00

PARABOLOIDS

Spun Magnesium dishes 17½" dia., 4" deep. Mounting brackets for elevation and azimuth control on rear. 3¼" x 1⅝" opening in center for dipole. Brand new per pair **$8.75**

All prices indicated are F O B Tuckahoe, New York. Shipments will be made via Railway Express unless other instructions issued.

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INC.
5 WAVERLY PLACE TUCKAHOE 7, N. Y.
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GUARANTEED BRAND NEW

LECTRONIC RESEARCH TUBE SPECIALS

STANDARD BRANDS ONLY

RECEIVING TUBES																			
OZ4G	.59	6F4	.69	2AP1	3.65	3C23	3.20	1B32	3.15	5D21	26.50	211	.62	879B	5.85	811	2.11
1A3	.65	6J6	.89	2AP5	5.95	3C31/EL-C1B	3.35	1B36	4.50	5U2S	14.20	211A	1.95	931-P1	3.77	813	7.25
1AB5	.77	6J7	.72	3AP1	4.63	4C35	21.00	1B42	9.80	5J29	14.20	221A	2.40	WL-670A	8.70	814	3.79
1B3GT	1.18	6K6GT	.52	3BP1	2.59	EL-C5B	8.95	1H20	.58	66J21	19.88	227A	2.40	WE-231D	1.25	815	1.72
1L4	.66	6K7	.54	3CP1	1.87	C&J	8.44	2B22	1.61	6J4	5.20	700B	16.90	RK-233A	2.95	816	.97
1R4	.29	6K8	.83	3DP1A	5.75	FG-17	2.89	2C26	.27	10T1	.58	700C	16.90	WE-244A	4.20	826	.97
1R5	.69	6L6	1.22	3EP1	2.92	FG-33	11.95	2C34	.28	10Y	.19	700D	16.90	WE-245A	1.35	828	13.45
1S4	.86	6L6G	1.11	3HP7	4.91	FG-81A	4.95	2C35	.79	15E	1.25	WE-249C	1.88	702A	2.95	829B	4.91
1S5	.64	6L6GA	.87	4AP10	5.35	91	5.85	2C43	.79	15R	.75	WE-254A	4.90	702B	3.87	830B	6.20
1T4	.64	6SB7Y	.79	5AP1	2.75	FG-95	20.60	2D22	7.80	RK-25	2.11	WE-257A	2.77	703A	3.90	832	3.35
2X2/879	.69	6SC7	.66	5AP4	4.75	FG-105	9.95	2J27	13.70	FG-32	4.25	WE-258A	1.27	706AY	45.00	832A	4.50
2X2A	.79	6SF7	.72	5BP1	2.40	FG-172	14.50	2J31	9.60	RK-34	.28	WE-300B	7.50	706BY	45.00	836	4.91
3A4	.61	6SG7	.69	5CP1	2.87	WE-388A	14.15	2J32	14.45	RK-36	.78	304TH	3.86	706CY	17.95	841	2.93
3A5	.96	6SH7	.44	5CP7	3.76	393A	5.77	2J33	19.90	RK-47	4.92	304TL	1.25	706FY	45.00	843	.49
3A8GT	1.76	6SJ7	.59	5FP7	1.05	394A	3.77	2J34	19.90	RF50	.45	307A	3.90	706GY	45.00	851	59.50
3B7/1291	.29	6SL7GT	.69	5HP4	3.35	GL-415 - 5550	22.00	2J37	13.70	VT-52	.36	WE310A	7.50	707A	5.22	852	27.50
3D6/1299	.29	6SN7GT	.79	5JP2	9.35	KU-610	6.35	2J38	12.70	53A	3.82	WE-313C	3.15	707B	6.95	860	6.40
3Q5GT	.79	6SN7W	1.45	5LP1	13.95	KU-628	16.90	2J41	132.50	RK-59	2.44	316A	.66	708A	4.85	861	4.50
3S4	.61	6V6	1.07	5MP1	10.65	KU-630	17.26	2J48	14.95	RK-60 1641	.59	WE-329A	2.90	709A	6.87	864	17.70
5R4GY	1.30	6V6GT	.59	7BP1	12.87	WL-634	17.26	2J61	36.20	RK-72	.92	WE-336A	3.10	710A	2.25	865	.19
5T4	.89	6W4GT	.65	7BP7	4.95	WL-652/-5551	38.00	2K28	23.95	RK-73	.92	WE-339A	3.22	713A	1.45	866A	.88
5U4G	.59	6X4	.59	7BP14	14.95	WL-672	13.25	2K35	19.95	VR-75 - 0A3	1.10	350A	2.80	714AY	6.95	869B	1.15
5V4G	.84	6X5GT	.59	9GP7	9.85	WL-677	24.00	2K45	19.95	75T	3.00	350B	1.95	715A	6.75	872A	27.00
5Z3	.65	7F7	.79	9LP7	3.88	WL-681/-5550	22.00	3A5/A	.79	VR-78	.34	354C	19.50	715B	9.95	874	1.88
6AB7/1853	.99	7N7	.79	10BP4	21.95	WL-682/-5551	38.00	3B22 EL-1C	1.12	VR-90 OB3	.81	WE-356B	4.45	717A	.97	876	1.65
6AC7 1852	.79	10Y	.19	10FP4	28.88	5550	22.00	3B23	4.75	VT-98-(BR)	29.90	361A	4.75	721A	3.93	878	.39
6AC7W	1.45	12A6	.24	12DP7	12.85	722A	3.75	3B24	4.75	VT-98-(BR)	29.90	371B	.82	723A	6.95	884	1.85
6AG5	.89	12AH7GT	.82	12GP7	12.85	873/973	6.95	3B24	1.29	C100E	2.20	388A	2.15	723A/B	10.50	885	.39
6AG7	1.19	12AT6	.59	902P1	3.95	884	1.35	3B27	1.29	C100F	2.20	417A	10.65	724A	5.22	956	.39
6AJ5	.89	12AT7	.99	905	4.47	885	1.29	3C24	.44	100R	2.90	434A	3.65	724B	3.22	957	.49
6AK5	1.20	12AU6	.72	915	4.90	1616	.97	3E29	6.20	100TH	10.25	446A	.88	725A	8.95	958A	.49
WE-6AK5	1.50	12AU7	.86	Photo Cells		1904	8.85	3J31	39.25	WE-101D	1.65	446B	1.95	726A	14.50	959	.49
6AK6	.82	12AX7	.86	1P24	.29	2050	.83	4-125A	26.95	WE-101F	3.62	450TH	19.70	730A	10.95	991	.49
6AL5	.69	12BA6	.64	918	.88	2051	.49	4-250A	36.75	VR-105 - 0C3	.72	451	1.75	731A	2.45	1003	.24
6AQ5	.72	12BA7	.86	919	1.79	Transmitting & Special Purpose Tubes		5CP1A	.79	75T	3.00	471A	2.75	WL-787	9.90	1201 7E5	.29
6AQ6	.65	12BE6	.64	923	.97			5FP7	3.77	VR-78	.34	SS-501	11.50	800	1.88	1203 7C4	.19
6AS7G	6.22	12C8	.59	927	1.67			4A1	.58	WE-124A	3.80	503AX	1.47	801A	.48	1294 1R4	.29
6AT6	.84	12SG7	.69	931A	3.22	0A2	1.32	4B32 EL-1P	2.44	WE-127A	2.40	506AX	1.47	802	4.25	1299 3Q6	.29
6AU6	.72	12SH7	.49	1645	1.67	0B2	1.75	5B	5.20	VR-150 - 0D3	.65	507AX	1.47	803	6.87	1602	.68
6AV6	.55	12SJ7	.49	Thyratrons and Ignitrons		1B22	3.87	4B24 EL-1C	.65			527	9.75	804	8.95	1613	.61
6BA6	.65	12SK7	.59			1B23	8.95	5C	2.44	FG-190	12.15	530	17.20	805	4.75	1616	.87
6BA7	.86	12SL7GT	.69	GA4G	.95	1B24	4.90	4B32 EL-6CP	8.79	203A	6.40	531	17.20	807	1.25	1619	.19
6BE6	.65	12SN7GT	.79	EL-C1A	3.35	1B26	4.50	203B	4.33	532A	3.15	808	2.19	1626	.69
6BG6G	1.72	12SR7	.69	2A4G	1.15	1B27	6.50	4C28	21.65	204A	27.90	559	1.41	809	2.49	1625	.19
6BH6	.72	28D7	.61	2D21	1.09	1B29	2.90	4E27	12.75	CR-206	3.15	561	1.45	810	7.95	1626	.29
6BJ6	.72															1629	.29

SEND FOR OUR COMPLETE TUBE LISTING

CAPACITORS

MOLDED OIL-IMPREGNATED PAPER

.02 MFD	200 VDC	.04½ Ea.	$3.00 per 100	
.05	200	.04½	3.00	
.1	200	.04½	3.00	
.25	200	.06	4.00	
1	600	.09	6.00	
.005	600	.04½	3.00	
.01	600	.07	4.25	
.05	600	.08	5.50	

FILTER CHOKES

ALL HIGH VOLTAGE INSULATION

13 H	250 MA	GEN. ELEC.	$3.22
10 H	400 MA	ACME	3.77
15 H	500 MA	AMERTRAN	9.20
14.7 H	130-570 MA	AMERTRAN	9.85
22.8 H	50-360 MA	AMERTRAN	18.75
.02 H	5 AMP	RCA	3.95

TEST EQUIPMENT

- Alfred W. Barber Labs. Mod. VM-25 VTVM $85.00
- General Radio Model P-500A Standard Signal Generator (Same as G. R. 805A except covers 9KC to 32 MC) $450.00
- Galvin Model CES-1 Standard Crystal Test Set

TS-10A/APN Delay Line Test Set	$45.00
TS-19/APQ-5 Calibrator	$75.00
AT-48/UP "X" Band Horn	$2.95
REL W-11M Frequency Meter 180-220 MC	$32.95
CWI-60AAG Range Calibrator for ASB, ASE, ASV and ASVC Radars	$39.95
CRV-14AAB Phantom Antenna for Transmitters up to 400 MC	$11.75

- Raytheon VR-5 Constant Voltage Transformer Input 95/130 V 60 cy—Output 115 V 500 W $38.50
- Sola Constant Voltage Transformer Input 95/125 V 60 cy.—Output 115 V 285 VA $24.70
- Federal Constant Voltage Transformer Input 95/135 V 50/60 cy—Output 115 V 210 W $34.00
- C-D Quietone Filter Type IF-10 110/220 V AC/DC 20 Amps $9.00

All Items New Except Where Noted. • (Exc. Used Condition)

PULSE TRANSFORMERS

UTAH 9262	$1.50
UTAH 9278	$1.50
G. E. 68G-627	$3.75
AN/APN-9 (90T256-501)	$1.25
AN/APN-9 (90T256-502)	$1.25
AN/APN-4 Block, Osc	$8.8

RADIATION COUNTER TUBES

1B90 GAMMA COUNTER	$9.67
AMPEREX 75NB (Beta & Gamma)	$9.90

Full Line of Amperex Radiation Counters in Stock

115 V 60 CY AC RELAYS

Struthers-Dunn Type 8HXX—SPST Normally Open 30 Amp Contacts $1.88

CRAMER Type CSM—Synchronous motor type 5 min. time delay—SPST normally open 10 Amp contacts $2.87

MONTHLY BULLETINS

SEND IN YOUR NAME AND ADDRESS TO GET ON OUR MAILING LIST

All material brand new and fully guaranteed. Terms 20% cash w/ order, balance C. O. D. unless rated. All prices F.O.B. our warehouse, Phila., Penna.

COAXIAL CONNECTORS

83-1AC	.42	UG-12 U	.63	UG-86 U	1.22		
83-1AF	.15	UG-21 U	.67	UG-87 U	.68		
83-1F	1.12	UG-22 U	.86	UG-171 U	1.38		
83-1H	.10	UG-23 U	.63	UG-175 U	.15		
83-1J	.80	UG-24 U	.67	UG-176 U	.15		
83-1R	.28	UG-27 U	.68	UG-180A U	3.82		
83-1SP	.28	UG-29 U	.83	UG-191 AP	.57		
83-1SPN	.28	UG-30 U	.94	MX-195 U	.41		
83-1T	1.12	UG-34 U	12.80	UG-197 U	1.53		
83-22AP	.85	UG-36 U	12.80	UG-206 U	.58		
83-22F	.88	UG-37 U	12.80	UG-255 U	.82		
83-22R	.60	UG-58 U	.57	UG-264 U	1.74		
83-22SP	.60	UG-85 U	.62	MX-367 U	.15		

Full Line of JAN Approved Coaxial Connectors in Stock. Send us your inquiries.

TYPE "J" POTENTIOMETERS

38c each

Resis.	Shaft	Resis.	Shaft	Resis.	Shaft
100	SS	10K	½"	50K	⅜"
200	SS	10K	SS	50K	SS
500	½"	15K	½"	100K	3/8
650	½"	15K	SS	100K	SS
1000	SS	20K	SS	150K	½
5000	3/8"	25K	1½"	250K	SS
6500	SS	25K	SS	250K	SS
10K	3/8"	100K	1½"	1 MEG	SS

Triple 100K - 3/8" Shaft - 1.47

All shaft lengths beyond bushing - SS (screw slot)

UNIVERSAL OUTPUT TRANSFORMER

RCA 15 WATT HIGH FIDELITY

PRI—1000/2000/4000/8000/16000 Ohms

SEC—2/8/15 Ohms

$1.60 Each — $1.52 Ea. Lots of 10

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GL-415/5550	$22.00
WL-681/5550	$22.00
WL-682/5551	$38.00

ROTARY CONVERTER

Janette Type CA-1B F with Filter Assy. Input—115 VDC. Output—110 V 60 cy 1.17A with spare brushes and brush-holders $28.80

PIONEER SERVO SYSTEM UNITS

- Type 12073-1A Torque Amplifier. Input 115 V 400 cy. Complete with Tubes $14.95
- Magnetic Amplifier Assy. Saturable Reactor Type to supply one phase of 400 cycle Servo Motor $5.95

OIL-FILLED CAPACITORS

50 MFD	220 VAC	$2.95
60 MFD	330 VAC	$4.89
32 MFD	2500 VDC	$10.00
7 MFD	660 VAC	$2.95
3.5-5 MFD	1000 VDC	.95
1 MFD	7000 VDC	$1.79
045 MFD	16 KVDC	$4.70

SPECIAL

2 MFD 12,500 VDC

INERTEEN TYPE FP

$23.95

SELENIUM RECTIFIERS

HALF-WAVE	130 VDC OUTPUT	
75 MA - .58	150 MA - .91	250 MA - 1.21
100 MA - .72		400 MA - 1.51

SOUND POWERED TELEPHONES

- U. S. INSTRUMENT Type A-260
- WESTERN ELECTRIC Type D-173911
- AUTOMATIC ELECTRIC Type GL-832BAO

U. S. NAVY TYPE M HEAD AND CHEST SETS

These are high quality heavy-duty units not to be confused with cheaper units now available. Designed to withstand exacting shock, vibration, salt water corrosion, temperature and pressure tests. ANY TYPE $14.88 ea., $28.00 per pair

SURPLUS EQUIPMENT TROUBLE SHOOTING MANUALS

(Includes Schematics)

BC-348 J, N, Q — SCR-522 — BC-779 — BC-610 $1.00 Each

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LOW INERTIA SERVO MOTORS

Freq. Cycles	100	Res.—Phase 1	306Ω
Volts—Phase 1	85	Res.—Phase 2	776Ω
Volts—Phase 2	68	No. of Poles	4
Current—Phase 1	110MA	Speed—RPM	2650
Current—Phase 2	40MA	Weight—Oz.	6.8
Input Watts—No Load	2650 RPM CW		5.8
Input Watts—Stalled			5.0
Torque Stalled—(Oz. In.)			.80
Temp. Rise °C)—2650 RPM—No Load			54
Temp. Rise °C)—Stalled			54
Reversing Time—(Seconds)			0.1
Moment of Inertia (G. CM.²)			6.7

Will Operate Satisfactorily at 60 Cycles Original Price $34.50—Our Price—$8.22 ea.

$7.50 EACH—Lots of 10

SPECIAL! 1N34 GERMANIUM DIODES 69¢

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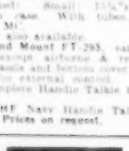
MEASUREMENTS CORP. TEST EQUIPMENT TRF: 15-25 and 100-250 meg., output 1-100,000 microvolts, modulation 400 or 5,000 cps. $49.50
TRC: 15-75 Mc and 90-125 Mc, continuously variable from 1-1000,000, output impedance 34 ohms. $100.00
TRE: 50-75 Mc, output 1-100,000 microvolts $60.00

T-28/APT-1 90-212 Mc Jammer. 2-832, 2-1N46Y, 3-6AC7, 1-6J6, 1-6x5, 1-931A, 2-6C4. **New $50.00 Used $25.00**

IE-19 Test set for SCR-522, ARC-3, ARC-1, ARC-5. Consists of 1-30 signal generator 100-156 mcg., 1-0-1 Field Strength Meter, 1-120 cost meter, battery case, wood trunk. $195.00

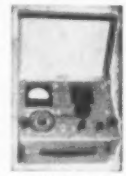
HANDIE-TALKIES BC-611: No wires to attach. Easy to operate. Push button controlled. No skill necessary. Already tuned to set frequency. Crystal controlled. Transmitter and receiver in same case. Only 5½ lbs with batteries. Batteries can be supplied. Small: 11¾"x8¾"x5¾". Aluminum case. With tubes, crystals. Freq. 3-4 Mc.
BC-611-F also available.
BC-721 and Mount FT-295, same size as BC-611, except airborne & revised improved chassis and bottom cover with connections for external control.
IE-17 complete Handie Talkie test equipment.
CRC-7 VHF Navy Handie Talkie, 100-156 Mc. **Prices on request.**



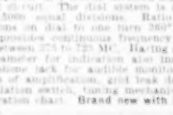
I-100 A portable test set for automatic radio compass. Has following features: Test automatic loop control circuit. Test loop motor and drive mechanism, calibration of compass deviation correction. Test and measurement of accuracy servo amplifier & test. Operates as a multiple range AC or DC vacuum tube voltmeter. **Price on request.**

BC-1000 Portable battery operated freq. mod. transmitter and receiver. Used for voice transmission and receiver over a distance of about 3 miles. Freq. 40-48 Mc, xtal controlled.

TUBE TESTERS 105 (TS-298/U): Dynamic Mutual Conductance designed to test std. receiving tubes and small transmitting tubes, which have filaments from 1.5V to 117V and 50 to 150V 117V AC 60 cy. input. PO-AN-GPM-1 ..... $55.00
Tube Tester Triplett 1183-SC (TS-393-U): For testing every type of receiving tubes also test ohm milliameter. AC & DC volts 0 to 10/50/250/500/1000, ohm per volt 10,000 DC, 2,000 AC. DC MA 0-1/10/50/250; resistance 0-500/5,000 ohm, 0-5-15 meg. PO 1-36-J $39.95



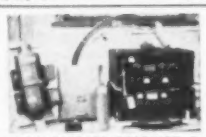
LAVOIE 105 SM A compact, self contained, battery powered precision freq. meter providing quick and accurate readings of frequencies with a minimum of operating controls. Accuracy is 1 in 10⁴ and maintained because of rugged construction, precision parts and fits. The tuning of the oscillator is done by varying the capacity in a totally enclosed high "Q" tuned circuit. The dial system is divided into 3000 equal divisions. Ratio is 50 divisions on dial to one turn 360°. This unit provides continuous frequency coverage between 375 to 725 MC. Having a 0-200 microammeter for indication also including headphone jack for audible monitoring, 2 stages of amplification, grid leak detector, modulation switch, tuning mechanism and calibration chart. **Brand new with book & probe.** $59.95



RT-34/APG-5 A 2700-megacycle xmitter & receiver using 2C40 rcvr. loc osc. 5621B, 1st det. 2C40 transmitter, 1F22 modulator, 6-6AK5, 30 Mc IF strip, 6AL5 detector, 6AK5, limiter, 6AK5 cathode follower, power supply uses 2-5z3, 1-VR & 1-VR105, 720 channels automatically scaled drum 9½ dia. x 16¾" long. With AS-68 ant. $59.50

FERRIS TEST EQUIP. 18B (I-(18): VHF Signal generator, 20-150 Mc, mod 400 cps. 115V, 60 cy input. $80.00
18F (TS-422/U): 25-42 Mc, 40-75 Mc, 150-195 Mc and 180-230 Mc output impedance 50 ohm, output 700MV max. freq 400 to 1000 cp at 30%. $175.00
BC-1206: 15-40 Mc, 95-115 Mc & 195-230 Mc 110V AC input. $125.00

ESPEY TEST EQUIP. I-122: RF Signal 15-25 Mc and 90-125 Mc modulated at 400-625 cps. 110V 60 cy. input. $60.00
I-126: 15-25 Mc and 95-225 Mc modulated by ant osc at freq of 400-8200 cps. 110V 60 cy input. $100.00



TBS TRANSMITTER-RECEIVER Transmitter CRV-52093, covers 60-80 Mc, xtal controlled, voice or tone modulation. Carrier power 50 watts. Receiver CRV-46068 will deliver 2 watts audio output to 500 ohm speaker with 16 microvolt output. Receiver operates from 115V 60 cy. Transmitter power is obtained from motor generator PCCG 21302 which is controlled by automatic starter 3CRV 21301 110V AC input. Transformer UHT 30445 440V AC 110V AC 60 cy. is used for receiver. Also included is copper transmission line, gas filled type 120 ft. long complete with fittings, couplings, gas flask and pressure gauge. Receiver uses following tubes: 1-956, 1-6F8-G, 1-685, 2-6C6, 2-6D6, 1-6F7, 4-808, 1-6AC, 2-6D6, 2-2As, 1-84. Transmitter tubes: 2-807, 4-808, 1-6AC, 2-6D6, 2-2A5, 1-84. All TBS equip. is brand new and was formerly used in small surface vessels for reliable communication within range of approx. 15 miles. $250.00

1073 WAVEMETER Pwr. supply section: 110V 60 cy. 330V DC 85 MA. 2 section filter. Also 33 tubes: 10-6N8Ts, 1-5Y3, 16H6, 1-6SJ7, 1-6V6, 1-6SA7. Can be purchased separate at $8.95
Wavemeter section: has high quality resonant cavity tuning from 450-210 MC oscillator, heterodyne amplifier, electric tuning eye, precision milled gear drive and collapsible antenna. Built-in oscillator checks against cavity for proper frequency setting. Uses 9002, 6SF5 and 6BY tubes. Used $14.00 Pwr. supply and wavemeter in one $22.50

C-1 GYRO Part of C-1 auto pilot and can be used to conduct many experiments. 24V DC input or can be operated for short periods on 110V AC. Will run 5 minutes after actuating $6.95

RECTIFIERS 300V DC at 100 MA type 4D-0243 D-162800 International Telephone Development Co. 4 in a stack. **Brand new.** $10.00

I-96 Used for tuning & aligning SCR-522, BC-624 and BC-625. In wood case, 4 compartments shielded. Battery or 110V AC 60 cy input. RF signal generator 100-156 MC PO-1E-Test Equip.

IB-70 Junction box contains start and stop switch components of phone and speaker control circuit, 2 key jack, 50 A circuit breaker and all necessary wiring to provide for inter-connection of receiver BC-312 and 342, transmitter BC-610, speech amp. BC-614 and speaker I.S-7, spare storage battery and lighting plant PE-95. PO-SCR-299. ..... $19.00

TS-16 A portable self contained unit to make comprehensive check of performance of all meter equip. **Price on request.**

BC-939 Couples output of transmitter to 15 ft. or lg. wire ant. from 2-18 MC. Has loading coil continuously variable, coupling coil indicator meter fixed vacuum capacitor. PO BC-610, transmitter and SCR-399 & 499 ..... $35.00

Orders promptly filled. Prices fob L. A. and subject to change. To save COD charge, send full price and only shipping charge will be COD. Or send 25% deposit. Minimum order $5.00. Export orders $25.00. Shipments via Railway Express unless otherwise specified. Inquiries and requests for quotations given immediate attention.

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Easily converted to an ideal intercommunication set for office — home — or factory.

Original—New $4.95

Like New 3.95

(With Schematic)

See April 1950 Radio News for complete conversion data.

All necessary parts and instructions to convert the above to AC operation with one remote station $8.25 additional.

BC-604 Transmitter FM 20-28 MC

11 and 15 meters. Can be operated on 10 meters —10 channel push button crystal. With all tubes and meter but less dynamotor. Excellent Condition $12.95

Crystals—Set of 10 ..... 14.95

BC-603—Companion receiver to above with tubes but less dynamotor ..... Used $17.50

TUBES

Drastically Reduced from 10 to 50%— Nationally Advertised Brands

Type	Net Price	Type	Net Price	Type	Net Price
1A4P	$0.24	6SF5GT	.34	39/44	.24
1A6	.19	6S7G	.39	49	.39
1B5/25S	.24	6S8GT	.59	50	.39
1B22	1.49	6S8G7	.59	56	.24
1B26	2.29	6SB7	.39	57	.24
1B29	.39	6SJ7	.69	76	.24
1B32-832A	2.29	6T7G	.39	77	.24
1C6	.19	6U7G	.29	211/VT4L	.79
1C7G	.19	6Z7G	.39	316A	.34
1D5GP	.24	6ZY5G	.29	371B	.34
1D7G	.19	7C4-1203A	.24	700A	7.95
1F4	.24	7E5-1201	.39	703A	1.49
1F5G	.24	10/VT25A	.19	705A	.79
1H4G	.24	12A6	.34	714AY	5.95
1J6G	.24	12AT6GT	.34	724B	4.95
1J6GT	.24	12A7	.34	801A	.39
1P5GT	.24	12AH7GT	.19	813	5.95
1V	.24	12BA6GT	.29	829	6.95
2A6	.39	12BE6	.29	832	4.95
2A7	.24	12J5GT	.24	837	1.49
2C26A	.19	12J7GT	.24	841	.29
2V3G	.49	12K8GT	.24	864	.79
2X2/879	.25	12Q7GT	.24	872A	.98
3FP7	.98	12SF5	.24	954	.19
4AP10	.98	12SF5GT	.24	955	.34
5BP4	2.95	12SF7	.24	957	.34
5CP1	2.95	12SH7	.24	1625	.19
5D21	9.95	12SR7	.24	1626	.24
5FP7	.98	12SR7GT	.29	1629	.24
5J23	5.95	12SN7GT	.59	1630	.29
5T4	.49	12Z3	.29	1636	2.95
5W4	.49	15R	.19	1638	.69
5Z4	.49	19	1.49	2050	.79
6AB7	.59	21Z2	.24	2050	.89
6AJ5	.89	25D7	.34	2051	.49
6B8	.59	30/NPEC		7193	.19
6C4	.29	(VT67)	.59	9002	.34
6D8G	.59	30	.24	9003	.39
6F5GT	.39	304TL	1.29	9006	.29
6F6G	.59	32L7GT	.39	GL4A21	.29
6H6	.29	33	.24	Amperite	
6J7GT	.39	34	.24	10T1	.29
6K6G	.59	35/51	.24	Jan CRP72	.98
6L5G	.39	36	.24	REL36	.69
6L7G	.39	37	.24	VR150	.39
6R7	.34	38	.24	VR105	.69

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I-82—5"	New	$4.95
Transmitter Selsyn for above		2.45
	both for	7.00
I-81—7"	New	3.45
Transmitter Selsyn for above		2.45
	both for	5.25
I-81	Used	2.45

T85/APTS UHF TRANSMITTER

operating over a frequency range of 300 to 1400 MCPC with a nominal output of from 10 to 30 watts. Unit is equipped with 110 V 60 CPS filament transformer, blower; lecher wire test frequency set; and 8 tubes—1-931A; 2-6AC7; 2-6AG7; 1—6L6G; 2-829B; 1-3C22 (GL522) (oscillator).

New in original box with Operating Instruction Manual $69.50

BC 620

Receiver-Transmitter—2 crystal channels — 20 to 27.8 MC FM—13 tubes. Metered. Plate and Filament. ..... New $14.95

Used 9.95

PE 97 Power Supply for above 6-12 volt vibrator type.

Used—complete $6.95

Used less tubes, vib. & cond. 2.95

FT 250 Mount for both BC 620 and PE 97 ..... New $1.50

BC 223

Brand new Transmitter with all three tuning units, two tuning unit cases, spare tube carrying case, shock mount and brace, but less tubes at new low price of $19.95

Set of 5 tubes 3.95

Tuning units are available separately at

Ea. $2.50

Cases at ..... Ea. .95

PE-125—12-volt Vibrator Pack...New $12.95

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Spare parts kit for PE 125 containing 2 tubes; 2 vibrators and 13 fuses in metal container with handle and clasp (DX 41)...New $2.95

RECEIVER—Easily Converted for Use in Citizens Band. Crystal Controlled Local Oscillator. Broad Band pass—20.7 MC IF's Complete with 7-6AJ5, 1—12SR7, 2—12SN7, 1—2SD7, Relays, crystals. Schematic furnished ..... New $7.95

Miscellaneous SPECIALS

	Used	New
ID-6/APN-4 Scope, Excellent	$29.50	
R-7APS-2 Receiver-Indicator		$79.50
R-78/APS-15 Receiver-Indicator	34.50	
BC-1287-A Scope	75.00	
ASB-7 Indicator Scope	12.95	
SCR-522 Transceiver 100 to 150 MC	34.95	75.00
BC-1206 Receiver, 200 to 400 KC	3.95	5.95
MN-26 C	17.50	24.95
RA-10-DA Receiver	17.50	24.95
T-to-APT-2 Transmitter	8.95	
RT-7-APN-1 Transceiver	6.95	9.95
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BD-71-6 Pos. Switchboard	9.95	12.95
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BC-347 Interphone Amplifier		2.95
I-70 Tuning Meter		.89
AM-61 Indicating Amplifier		9.50
SCR-625 Mine Detector		39.50
PE-237 Power Supply		12.95
BC-461 Veeder Root Counter		.59
BC-442 Less Condenser	1.49	1.95
A-27 Phantom Antenna		.98
APS-13 UHF Antenna Pair		.98
Manual for BC-312&-342-3		1.00
Manual for SCR-269-G		2.50
FL-8 Filter	2.95	
I-97 Bias Meter	4.95	3.95
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One Tube Interphone Amplifier		
Small compact aluminum case fully enclosed. 2¼"x 3¼"x5¼". Less Tubes		.79
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BC-709 Battery operated lightweight interphone amplifier. Complete with tube and shock mount, but less battery	New	3.95
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Motor—Universal Electric, 24 VDC, will also operate on 24 VAC. Diameter 1¼"; Length 2A". Shaft ¼" x ⅝"	New	1.49
BC-746 Bantam one watt foundation (See QST Jan. 1949). Contains 2 crystals, coil, tuning condensers, etc. Numbers 1-7-10-11-12-13-76. Each		.95
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BC-639 Receiver with RA-42 Rectifier
RTA-1B Transceiver
TA-2124 Transmitter and MP-10G Power Jack
SCR-269 Compass Installation
R-5/ARN-7 Compass Installation
MN-26 Compass Installation
I. L. S. Installation (R-89-BC733)
SCR-584 Components
R-132-TPS-1B Radar Receiver
MD-22-URA-7/ Radar Modulator
AN/APR1 Receiver and Tuning Units
ASB7 Complete Radar Installation
TS-251 Test Set
BC221 Freq. Meter

MONTHLY SPECIAL!

MN-26 Y Compass Receiver

12 tube superhet covering frequencies of 150 to 325 KC; 325 to 695 KC; 3400 to 7000 KC in three bands. Complete with dynamotor and tubes. Like New..... $14.95

Model 15—Ground radar training unit complete 115 V 60 CPS operated. Consists of 218 MC transmitter; power supply; and pulse generator. Trains operator to detect land, air or sea targets and can be adapted to various receiver-indicator sets operating at 515 MC. New, with instruction manual.. $225.00

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T-17D Carbon Mike	New	2.75
T-24 Hi Imp. Carbon Mike	New	1.19
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BC-458	5.95	
BC-696 (or T19)	14.95	24.95
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BC-442		2.95
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Complete Command set as removed from aircraft — 3 receivers — 2 transmitters — Relay unit—control boxes—mounting racks—plugs—modulator and dynamotors—crated. ..... Set $34.50

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DM-28—For BC-348 with Mount and Filter	New	$6.95
	Used	3.95
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PE-206	New	6.95
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PE-73	New	3.95
DM-53	New	3.95
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DM-32	New	1.95
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TEN TUBE SUPERHET RECEIVER

with crystal controlled local oscillator. Has provisions for six crystal channels between 108 to 112 MCPS complete with tubes and crystals but less dynamotor

New $7.95

Like New 5.95

Less Tubes and dynamotor but new 3.95

HERMETICALLY SEALED CHOKES

10H. 100 M.A.	.59¢	**3.7 H.** 145 M.A.	.59¢
50 H. 100 M.A.	.95¢	**10 H.** 20 M.A.	.39¢

5x5x1x1 H—4 winding layer wound.

.5 H at 2.56 A 140 ohms

1 H at 1.56 A 320 ohms **New $0.49**

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4 mfd. 1500 VDC. OIL FILLED	.29
	10 for 2.49
2 mfd. 600 VDC. OIL FILLED	.39
	3 for 1.00
1 mfd. 600 VDC. OIL FILLED	.24
	5 for 1.00
1x1x1—1200 VDC. OIL FILLED	.59
	2 for 1.00
50 mmfd—5KV—5 Amp. Vacuum Cond.	1.19

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TEST EQUIPMENT

state asking price, age and condition in first letter.

W-1150, Electronics
330 W. 42nd St., New York 18, N. Y.

WILL BUY ALL

BC-348'S WITH DYNAMOTORS

Letters "J", "N" & "Q" ..... $60.00 ea.
All others except "C" ..... $50.00 ea.
Ship via Express C.O.D. subject to Inspection to:

H. FINNEGAN
49 Washington Ave. Little Ferry, N. J.

WANTED TO BUY

Large and small quantities of new or used electronic government or manufacturers' surplus tubes and equipment. Highest prices paid. State quantity, condition and best price in first letter.

W-2369, Electronics
330 W. 42nd St., New York 18, N. Y.

WANTED

INSULATORS; POLE LINE HARDWARE; GUY STRAND WIRE; COPPERWELD WIRE; WESTERN ELECTRIC TOOLS; SPLICING SLEEVES.

VICTOR-BERNARD INDUSTRIES
NE Cor 22nd & Lehigh Aves., Phila 32, Pa

WANTED TO BUY

PRIVATE LABORATORY Wishes To Purchase For Its Own Use High Grade Test Equipment and Basic Radio Components. Replies Held In Confidence.

W-6595, Electronics
330 West 42nd St., New York 18, N. Y.

ATTENTION! TV Schools Studios Experimenters

TELEVISION CAMERA

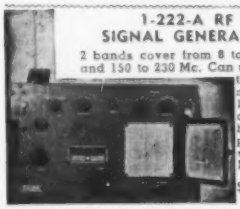
Just arrived! Fills a raft of vital TV uses. 350-lines resolution. Easily converted to present R.M.A. standards. Circuits available with cameras. Complete like new.

1100-A
FOUR TRANSMITTERS IN ONE

Can be present on 4 bands. Has BFO or extal on each from 1.5 to 10 mcs. Oscillators are all between 1.5 and 5 mcs. 6L6 osc. VR-150 regulator, buffer or doubler is a 6L6 into 2-807's in parallel. 125 watts on phone and 125 watts on cw, modulator has 4-6L6's in push-pull parallel. Rig has telephone dial on front for selecting any one of 4 transmitters, selecting phone, CW, turning heaters on, plate current, or turning everything off. Also has remote control unit for remote operation. Used, but in excellent condition **$225.00** With Remote

SCR-528 FM RECEIVER & XMTR: Complete with 80 xtals for operation in the 20-27.9 mcs. Powered by 12 or 24 VDC, with crystals, dynamotors, rack, mike, headset, mast base and section. Used but excel. cond.

APS-6 RADAR: Complete. Excellent Condition.



1-222-A RF SIGNAL GENERATOR

2 bands cover from 8 to 15 Mc., and 150 to 230 Mc. Can use up to the 3-harmonic; 110 V, 60 cycles built in power supply. New, **$125.00**

APS-4 RADAR: Complete. Excellent condition.

APS-4 COMPONENTS: Indicators, control boxes, junction boxes, 800-1C inverters, amplifier boxes, cords and plugs.

VARIAC TRANSTAT AMERTRAN

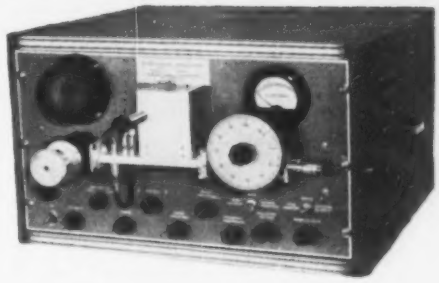
Input 0-115 V., 50-60 cycle; output 115 V 100 amps. 11.5 Kva. Excellent condition **$75.00**

COLUMBIA ELECTRONICS Ltd.

524 S. San Pedro St., Los Angeles 13, Cal.
Cable Address: COLELECT

25% deposit with order. Balance C.O.D.
All items subject to prior sale.

TEST EQUIPMENT



X BAND SPECTRUM ANALYZER 8500-9600 Mc., calibrated linear below cut-off attenuator, calibrated frequency meter, tuned mixer, 4 I.F. stages, 3 video stages overall gain 125 db., regulated power supply

S BAND SPECTRUM ANALYZER 2700-3900 Mc., similar to above.

The above Spectrum Analyzer also available with S and X band tuning units.

K BAND TEST LOAD $20.00

X BAND POWER, Frequency and SWR Measuring Equipment complete with R.F. source, A.S.D. equipment.

X BAND BELOW CUT-OFF WAVE GUIDE ATTENUATOR, with calibrated dial, type N input connector, output connects to ½" x 1" wave guide $55.00

APR-1 or APR-4 RADAR SEARCH RECEIVER. 30 mc I.F., 2 mc wide.

TUNING UNITS FOR APR-1 or APR-4 RECEIVERS can be used with any 30 mc amplifier:

TN-19, range 1000-2000 mc, tuned mixer cavity $150.00

TN-54, range 2000-4000 mc, tuned mixer cavity $150.00

30 MC I. F. STRIP AND 110 VOLT 60 cps POWER SUPPLY, bandwidth 10 mc, complete, new (part of APN-5 Receiver) $65.00

TS-45A/APM-3 SIGNAL GENERATOR, 9200-9600 mc, 110 V, 60-800 cps $350.00

TS-155A/UP S BAND SIGNAL GENERATOR, pulsed, calibrated output, 110 V, 60 cy., NEW $1250.00

TS-56/AP SLOTTED LINE, slot length 16", tuned probe and meter $100.00

TS-35/AP X BAND SIGNAL GENERATOR, pulsed, calibrated power meter, frequency meter, 8700-9500 mc $1250.00

TS-13/AP X BAND SIGNAL GENERATOR, pulsed, calibrated output, 110 V, 60 cycles $1250.00

X BAND VSWR TEST SET TS-12/AP, complete with linear amplifier, direct reading VSWR meter, slotted waveguide with gear driven traveling probe, matched termination and various adapters, with carrying case, NEW. UNITS I AND II are available separately or together as a test set.

S BAND SIGNAL GENERATOR CAVITY WITH CUT-OFF ATTENUATOR, 2200-2950 mc, 2C43 tube, with modulator chassis $30.00

HIGH PASS FILTER F-29/SPR-2, cuts off at 1000 mc and below; used for receivers above 1000 mc $12.00

UPN-1 S BAND BEACON RECEIVER-TRANSMITTER $75.00

S BAND TEST LOAD TPS-55P/BT, 50 ohms $8.00

X BAND TEST LOAD, 50 WATTS $35.00

250 WATT X BAND TEST LOAD, VSWR less than 1.15 between 7 and 10 KMc $150.00

LAF-1 SIGNAL GENERATOR, 100-600 mc, CW & pulse modulation, calibrated output, good condition, 110 v, 60 cps operation $250.00

GENERAL RADIO PRECISION WAVEMETER TYPE 724A, range 18 kc to 50 mc, 0.25% accuracy, V.T.V.M. resonance indicator, complete with accessories & carrying case, NEW $175.00

GENERAL RADIO SIGNAL GENERATOR 605-B, good working order $300.00

GENERAL RADIO VACUUM TUBE BRIDGE, Model 561D $275.00

FEDERAL RADIO 605-CS, 9 kc to 50 mc SIGNAL GENERATOR (JAN version of G. R. 605 ..... $350.00

HEWLETT-PACKARD AUDIO SIGNAL GENERATOR 205A $230.00

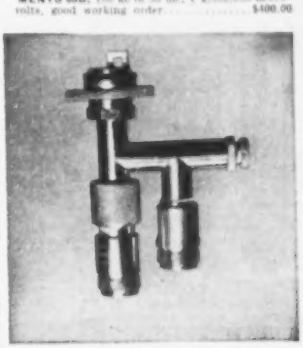
TBN-3EV THERMISTOR BRIDGE

S BAND THERMISTOR BRIDGE CU-60 ABU, Part of LZ Radar $60.00

FERRIS MODEL 22A SIGNAL GENERATOR, 85 kc to 25 mc, output 2 microvolts to 1 volt, modulation variable, good working order $175.00

FERRIS MODEL 10B SIGNAL GENERATOR, 85 kc to 25 mc, calibrated output, good working order $100.00

STANDARD SIGNAL GENERATOR MEASUREMENTS 65B, 100 kc to 30 mc, 1 2,000,000 microvolts, good working order $400.00



S BAND CRYSTAL MIXER (illustrated). Variable Oscillator Injection $12.50

S BAND MIXER, tunable by means of slider, type N connector for the R.F. and local oscillator input, U.H.F., connector for the I.F. output, variable oscillator injection $30.00

FIXED ATTENUATOR PADS, 20 db ± 0 — 2 db, DC-1200 mc, 50 ohms, VSWF 1.3 or less, 2 watts average power $30.00

WAVEGUIDE BELOW CUT-OFF ATTENUATOR, type N connectors, rack and pinion drive, attenuation variable 120 decibels, calibrated 20-120 db, frequency range 700-2000 mc $32.00

WAVEGUIDE BELOW CUT-OFF ATTENUATOR, similar to above except upper frequency limit is 3300 mc $32.00

WAVEGUIDE BELOW CUT-OFF ATTENUATOR, same as above except input is matched in range of 2200-3300 mc. VSWR less than 1.2 ..... $34.00

PULSE INPUT TRANSFORMER, permalloy core, 50 to 4000 kc impedance ratio 120 to 2350 ohms $1.00

PULSE TRANSFORMER, 132 AWF $6.00

PULSE TRANSFORMER, GE 68G, 528G-1 ..... $5.00

TS-10/AP CALIBRATED DELAY FOR APN-1. ..... $25.00

TS-203/AP CALIBRATED SELSYN $10.00

UG-27/U TYPE N RIGHT ANGLE ADAPTERS 10 for $5.00; 1000 for $250.00

SD-3 SHIPBOARD RADAR. New and complete with test equipment $1,050.00

SQ RADAR, used but in good working order, complete with antenna, control unit $650.00

SN RADAR, used, good working order, complete $550.00

HYPERSIL CORE CHOKE, 1 Henry, Westinghouse L-422631 or L-422032 ..... $3.00

PULSE FORMING NETWORK, 20 kv, .02 microsecond, 50 ohms, 800 p.p.s. $40.00

ELECTRO IMPULSE LABORATORY

P. O. Box 250 *Eatontown 3-0768* Red Bank, N. J.

BRAND NEW U. S. GOV'T. SURPLUS GUARANTEED

POWER RHEOSTATS

Ohms	watt	ea.	Ohms	watt	ea.
7	225		150	150	
8	100	G	200	25	G
8	225	P	200	150	P
8	225	T	225	50	T
8	50		250	25	
8	100	O	250	75	O
8	150	U	250	100	U
8	25	R	375	150	R
8	50		400	25	
8	75	F	400	75	F
8	50	L	500	75	L
10	25	V	585	150	V
10	100	E	750	25	E
12	50		750	150	
15	25	R	1000	25	R
16	50		1200	225	
22	50	#	1250	50	#
25	25	5	1250	150	5
32	300	0	1500	50	0
50	25	3	2000	25	3
50	50		2000	50	
60	750	F	2500	100	F
60	25	O	3000	25	O
75	150	R	3000	100	R
80	50		3500	50	
80	500	F	5000	25	F
100	25	R	5000	50	R
100	50	I	7500	50	I
100	225	C	7500	100	C
125	25	R	10000	50	R
125	500	S	10000	100	S
150	50		20000	150	

Specify whether shaft required is for knob or screwdriver type
(Discount to Quantity Users)

SELECTOR SWITCHES

Pole	Pos	Deck	Type	Each
1	6	1	bak-shtg	$1.1
1	12	1	cer-n shtg	55
1	24	3	bak-n shtg	69
1	36	3	bak-n shtg	79
2	2	1	cer-shtg	39
2	6	2	bak-n shtg	49
2	6	2	bak-shtg	.54
2	11	2	bak-shtg	.60
4	4	2	cer-n shtg	.54
4	11	4	bak-shtg	1.20
4	3	2	cer-n shtg	.56
6	11	6	bak-n shtg	1.98
10	5	6	cer-shtg	1.49
12	2	3	bak-shtg	.75
16	2	4	bak-n shtg	.98

"AN" CONNECTORS

LARGE VARIETY AVAILABLE AT GREAT SAVINGS

Send your specs and let us quote

BIRTCHER TUBE CLAMPS

14¢ ea.

$12.00 per 100

#926-A	#926-B22
#926-A1	#926-C
#926-B	#926-C1
#926-B1	#926-C3
#926-B2	#926-C10
#926-B7	#926-C24

OIL CONDENSERS

Mfd	VDCW	Each
.1	3000	.75
.1	6000	1.89
1	20,000	18.95
.25	3000	1.10
.5	1500	.89
1	600	.55
1	2000	1.95
2	600	.55
2	600	.79
2	1000	.79
4	600	.69
4	400	.75
6	600	.79
10	600	.98
16	600	1.75
15	600	1.98
15	1000	3.25
2 x .1	7000	3.95
2 x .5	9000	14.95

IMPORTANT

to

Purchasing Agents

BARGAINGRAM also FREE Pilot Lamp Extractor

WRITE TODAY!

BATHTUBS

mfd	vdcw	each
.033	400	.17
.05	200	.17
.05	400	.19
.05	600	.21
.1	400	.20
.1	600	.22
.1	1000	.32
.15	600	.22
.25	200	.19
.25	600	.23
.35	400	.22
.5	400	.23
.5	600	.25
.5	1000	.35
1	200	.29
1	600	.35
2	400	.44
2	600	.59
4	50	.25
8	500	.59
.25	50	.28
.25	75	.30
.40	25	.27
.50	25	.28
200	12	.35
300	6	.39
.05-.05	600	.29
.05-.05	1500	.65
.1-.05	200	.25
.1-.1	400	.26
.1-.1	600	.28
.16-.16	600	.28
.2-.2	500	.29
.25-.25	600	.30
.5-.5	600	.35
1.0-.1	300	.29
200-200	9	.49
3 x .05	600	.40
.5x.1	400	.42
.5x.1	600	.45
.5x.25	600	.50
.1x1.0	100	.40

Specify Top, Side or Bottom Lugs.

TYPE "J" POTENTIOMETERS

Specify whether regular or screw-driver shaft is required.

TYPE "J" 50c

ohms	ohms	ohms
40	2000	20K
100	2100	25K
150	2200	30K
200	4000	50K
300	4700	75K
400	5000	80K
500	10K	100K
600	11K	200K
1000	12K	250K
1400	15K	500K
1500	16K	1meg

When ordering locking type bushings, locking nuts are available in the following types:

Hex shaft lock @ .05
Acorn " " @ .10
Knurled " " @ .10

TYPE "JJ"

$1.25	$1.50
ohms	ohms
100-100	100K-100K
200-200	130K-130K
500-500	150K-150K
600-600	200K-200K
1500-1500	250K-250K
2000-2000	350K-5000
2200-24K	350K-25K
20K-2000	500K-500K
25K-10K	500K-75K
45K-5000	1meg-1meg
50K-50K	2meg-2meg
	4meg-2meg
	5meg-5meg

TYPE "JJJ" $2.25

ohms
20K-200K-20K
45K-27K-2500
700K-700K-700K
750K-750K-750K
800K-800K-800K
1meg-1meg-1meg

TRANSMITTING MICAS

Type 9

Type 4

mfd	vdcw	type	ea.	mfd	vdcw	type	ea.
.00001	600	4	18	.00162	600	4	.18
.00003	600	4	18	.002	600	4	.20
.00005	600	4	18	.002	1200	4	.48
.00005	2500	9	31	.0022	2500	9	.78
.0001	600	4	18	.0025	600	4	.25
.0001	2500	9	31	.003	600	4	.25
.000152	600	4	18	.0039	600	4	.25
.0002	600	4	18	.005	600	4	.25
.00025	600	4	18	.005	1200	9	.60
.0005	600	4	18	.005	2500	9	1.15
.00051	2500	4	43	.0062	600	4	.30
.0007	600	4	18	.01	600	4	.40
.0008	600	4	18	.01	600	9	.49
.0009	600	4	18	.01	1200	9	.98
.001	600	4	18	.0142	600	4	.45
.001	1200	9	31	.02	600	4	.55
.001	1200	9	31	.02	1250	9	1.36
.0013	600	4	18	.027	600	4	.66
.0015	600	4	18	.043	600	4	.99

"UHF" Coax Cable CONNECTORS

83-1R 83-1AP 83-1SP

Cat. No.	Army No.	Type	Each	Per/C
83-1AP	M-359	Plug	.35	.28
83-1D	PL-271	Adap	1.25	1.00
83-1F	PL-274	Feed	1.10	.90
83-1R	SO-239	Rec.	.35	.28
83-1SPN	PL-259A	Plug	.35	.28
83-22R	UG-264	Rec.	.50	.40
83-22SP	UG-102-U	Plug	.65	.60

Open Accounts to Rated Concerns
Prices net F.O.B. our nbse NYC.
Send for our Catalog

ALEXANDER MOGULL CO., INC.

161 Washington St., N. Y. 6, N. Y. WOrth 4-0865

D.C. MICROAMMETERS

0-200 ua 3" sq. G.E. DO 50 ..... $ 8.00
0-100 ua 3" sq. G.E. DO 50 ..... 10.00
0-50 ua 3" sq. G.E. DO 50 ..... 12.00

R.F. MILLIAMMETERS

0-115 Ma 3½" Weston 425 ..... $12.00
0-100 Ma 3½" Weston 425 ..... 12.00

PRECISION PORTABLE INSTRUMENTS

Single or multi-range

D.C. Micro-ammeters, from 5 ua full scale. Thermo-couple Milliammeters, from 15 Ma. Thermo-couple voltmeters.

Precision Electrical Instrument Co.
146 Grand Street New York 13, N. Y.

ELECTRONIC TUBE-MAKING MACHINERY

For manufacturing radio tubes, electronic tubes, cathode-ray tubes, lamps. New and used. Reasonably priced, satisfaction guaranteed.

AMERICAN ELECTRICAL SALES CO.
67 E. 8th St. New York, N. Y.

ATTENTION FOREIGN BUYERS

WE HAVE RC52F TRANSMITTERS

completely rebuilt and guaranteed, priced at $1250.00. This fine unit is suitable for international CW and phone transmissions, airport traffic control and general commercial use.

WESTON LABORATORIES
WESTON 93, MASS.

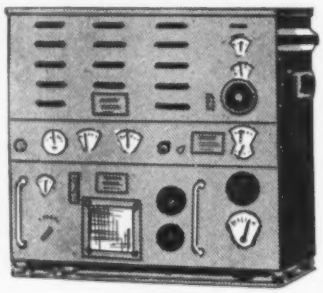
R.C.A. Electronic Counters

FOR SALE

Two type WF98A and WF99A
Complete with all accessories

Springfield Machinery Exchange
20 Belle St. Springfield, Mass.

Select SURPLUS ELECTRONIC Equipment



AIRCRAFT RADIO TRANSMITTERS

Type BC-375-E

100 watt output. Frequency range 200-500 and 1500-12kc., complete, new, with all tuning units, dynamotor, tubes, plugs, etc. Brand new in original packing. Not removed from aircraft. Original cost $1800. **$97.50** ea.

Navy Model TDE Radio Transmitters

Frequency range 300 to 18,000 kc., 125 watt output on C. W., 25 watts on phone, for operation on 230 volts D.C. power supply, complete with tubes and ready for operation.

Our information indicates that these units cost the U. S. Navy $8,000 ea. We offer them to you at a mere fraction of the original price. **$675.00** ea.

BD-72 Field Telephone Switchboards

These sets are sold individually packed in strong, steel-strapped, wooden cases, and they are ready to set up and operate. **$37.50** ea.

Radiomarine Corporation Telegraph Transmitter Model ET-8023 D1

Power output 200 watts master-oscillator or crystal controlled in operation. Frequency range 2,000 to 24,000 kc., in nine overlapping bands. New, in original export packing. Complete with tubes and typewriter table.

Does not include motor generator power supply. **$375.00** ea.

Generating Plants Type PE-197, 5 KW

Gasoline-engine driven. 120 volts, 60 cycles AC, manufactured by Hobart with Hercules 4-cylinder engine, water cooled, including cable, set of tools, automatic starting. **$675.00** ea.

Navy Model TCS Transmitters-Receivers

Covering 1.5 to 12 mcs. Output 25 watts. Complete with remote control, power supply, antenna tuning unit, cables, key and microphone. Available for 110-220 volts AC and 12 or 24 volt operation. Ask for special leaflet and prices.

ALL ITEMS ARE OFFERED F.O.B. OUR WARE HOUSE, AND ARE SUBJECT TO PRIOR SALE. ALL ITEMS ARE NEW, UNUSED SURPLUS UNLESS OTHERWISE INDICATED. ASK FOR COMPLETE LISTING ON OTHER DESIRABLE EQUIPMENT. SEPARATE TECHNICAL BULLETINS ON ALL EQUIPMENT AVAILABLE UPON REQUEST.

FRENCH-VAN BREEMS, Inc.

405 Lexington Avenue, New York 17, N. Y.

NOTICE! IF YOU OPERATE ANY WESTERN ELECTRIC TRANSMITTER

We have **SPARE METERS** from the discontinued Western Electric Transmitter program. If you own or operate any of these units and need spare meters, now is your chance to stock up on them, at only a small fraction of replacement costs. These are scarce items and you won't have another opportunity like it! ACT NOW! LIMITED QUANTITIES! STOCK UP!

All units are 7½" Round, Surface mounting Switchboard Meters, with Black scales.

GENERAL ELECTRIC METERS DC & RF model DR-2, AC model AR-2

RANGE	SCALE	CAPTION	NOTES	W.E. KS#	Price
1 Amp D.C.	0-1	"Amperes D.C. Total Plate"	Self contained	8304	$17.50
1 Amp D.C.	0-1	"Amperes DC 1 KW Plate"	Self contained	13768	17.50
3 Amp D.C.	0-3	"Amperes DC 3 KW Plate"	Self contained	13675	17.50
3 Amp D.C.	0-3	"Amperes DC 10 KW Plate"	Self contained	13676	17.50
300 MA RF	0-300	"Volts RF Transmission Line"	With internal vacuum couple	13605	27.50
5 Amp R.F.	0-5	"Amperes RF Transmission Line"	Leas Thermocouple	8305	17.50
5 Amp R.F.	0-5	"Amperes RF Antennae"	With external thermocouple	8306	27.50
5 Amp R.F.	0-8	"Amperes RF Antennae"	With 5 ampere couple	8312	27.50
6 Amp R.F.	0-6	"Amperes RF Antennae"	With external couple	8313	27.50
6 Amp R.F.	0-6	"Amperes RF Tranamission Line"	With external thermocouple	8305	27.50
4 KV D.C.	0-4	"Kilovolts DC Amplifier Plate"	1 MA. with tubular multiplier	13606	22.50
4 KV D.C.	0-4	"Kilovolts DC 1 KW Plate"	1 MA. with tubular multiplier	13769	22.50
10 KV D.C.	0-10	"Kilovolts DC 10 KW Plate"	1 MA. with tubular multiplier	13638	30.00
12.5 KV D.C.	0-12.5	"Kilovolts DC Power Amp Plate"	1 MA. with tubular multiplier	13677	32.50
6 MA D.C.	0-6	"Kilowatts RF Output"		13744	17.50
10 MA D.C.	0-12	"Kilowatts RF Output"		13745	17.50
300 V A.C.	0-300	"Volts A. C. Power Supply"	Self contained	8302	20.00

WESTON METERS DC & RF model 252, AC model 260

1 Amp D.C.	0-1	"Amperes DC 1 KW Plate"	Self contained	13768	17.50
3 Amp D.C.	0-3	"Amperes DC 3 KW Plate"	Self contained	13675	17.50
3 Amp D.C.	0-3	"Amperes DC 10 KW Plate"	Self contained	13676	17.50
300 MA R.F.	0-300	"Volts RF Transmission Line"	With internal vacuum couple	13605	27.50
4 KV D.C.	0-4	"Kilovolts DC Amplifier Plate"	1 MA movement, tubular Multiplier	13606	22.50
4 KV D.C.	0-4	"Kilovolts DC 1 KW Plate"	1 MA movement, tubular multiplier	13769	22.50
5 KV D.C.	0-5	"Kilovolts DC 3 KW Plate"	1 MA movement, tubular multiplier	13770	25.00
12.5 KV D.C.	0-12.5	"Kilovolts DC Power Amp Plate"	1 MA movement, tubular multiplier	13677	32.50
6 MA D.C.	0-4	"Kilowatts R.F. Output"		13744	17.50
10 MA D.C.	0-12	"Kilowatts R.F. Output"		13745	17.50
300 V A.C.	0-300	"Volts A.C. Power Supply"	Self contained	8302	20.00

WESTINGHOUSE METERS DC & RF model SX, AC model SY

1 Amp D.C.	0-1	"Amperes DC Total Plate"	Self contained	8304	17.50
300 MA R.F.	0-300	"Volts RF Transmission Line"	With internal vacuum couple	13605	27.50
500 MA R.F.	0-1000	"Volts RF Power Amp. Trans. Line"	With internal vacuum couple	KSA0680437	27.50
6 Amp D.C.	0-6	"Amperes RF Transmission Line"	With external couple	8307	27.50
4 KV D.C.	0-4	"Kilovolts DC Amplifier Plate"	1 MA. with tubular multiplier	13606	22.50
5 KV D.C.	0-5	"Kilovolts DC Amplifier Plate"	1 MA. with tubular multiplier	8303	25.00
10 KV D.C.	0-10	"Kilovolts DC Power Amp Plate"	1 MA. with tubular multiplier	KSA0680434	30.00
300 V A.C.	0-300	"Volts A.C. Power Supply"	Self contained	8302	20.00

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@ 6 V. DC	275 V. 50 MA.	w Blower	$3.95
12-24 V. DC	440 V. 200 MA.		
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12 V. DC	330 V. 150 MA.	BD-87	5.95
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Kit	Amperes DC	Net Price
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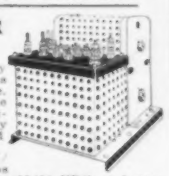

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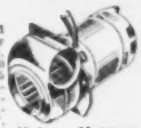

2K85881 — Brand New — Heavy Duty Sirocco type blower, capacitor start, 1/40 H.P. 3400 RPM 115 VAC 60 cycles. Displaces 84 C.F.M. Extremely quiet operation. Opening 2⅝", overall size 7½" long, 6" diam. Moisture and fungus resistant. With capacitor. Shpg. Wt. 15 lbs. Quantity limited **$13.95**

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Standard Brands

12 Mmfd. 20 Kv **$4.95**
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Overall length: 6½". Diam. 2-3/16". Terminal Diam: ¾". Shpg. Wt. 3 lbs.

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Heater voltage 115 V. Norm. open SPST contacts, 15-30 sec. delay. Contact rating 115 V, 3A., 440 V, 5A. Size 2⅛" x 1⅛" diam. Standard 4 prong tube base ..... **98c ea.**

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Attractive, rugged and reasonably priced. Moving vane solenoid type with accuracy within 5%. Square case.
0-6 Amperes D-C
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Any range **$2.49 ea.**

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5-20 Mmfd Zero Temp	24¢
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Copper Sulphide, F.W.B., 3.5 r.m.s. a-c in, 1.6 v. d-c @ 1 amp out. (Ideal for 1.5 v. d-c filaments). New, boxed. $.60 each, 10 for $5.00, 100 for $40.00.

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Discount 20% on orders over $50.00

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1N21	.60	715A	7.50
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3B22	2.50	721A	2.75
250TL	19.50	722A	7.50
316A	.35	724B	2.50
388A	2.75	725A	8.50
700A	9.75	730A	10.50
701A	3.50	816	67.50
702A	2.75	872A	1.75
703A	2.75	C5B	7.75
704A	1.00	C6A	8.25
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SPECIAL: Rectigon, Westinghouse Battery Charger Tube, 6 amp, 65 v., Cat. #2B26/14/JAN4B2B. New, orig. box. $1.50 each, 4 for $5.00.

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115 v., 60 cy. 1 phase input, output 0-15,000 v. d-c @ 500 ma. Write for detailed information.

CIRCUIT BREAKERS Westinghouse Type "AB" De-ion, Thermal Trip Without Enclosure, 3 pole, 50 amp frame size. Specify 15 amp, 25 amp, or 50 amp rating. New $3.75 each, 3 for $10.00.

Filament Transformer

HIGH VOLTAGE FILAMENT TRANSFORMERS: American Type W-8. 050 KVA, 50/60 c., 1 phase, 85 KV test, 13 KV d-c operating; sec. 3 v. c-t at 10 amps. Has socket that takes 872A, 250TL, 571, 5563 etc. rectifiers. Net Wt. 16 lbs. $12.50 each, 2 for $22.50, 4 for $40.00.

ALL BRAND NEW
ELECTRONIC SURPLUS
from Army-Navy stockpiles

RA-10 DA Aircraft Communications Receiver, Bendix Mfg., complete with Control Box, plugs, mount, tuning shaft (24 v.)..... Set $69.50
BC-375 E Aircraft Transmitter, G. E. mfg. Complete with 7 Tuning Units, Ant. T. U. Dynamotor, plugs..... Set $75.00
MN-26 C Manual Direction Finder Receiver, Bendix Mfg.....ea. $24.50
MN-26 E Rotatable Loop 9" Ring type.....ea. $10.50
MN-52 H Azimuth Control, Bendix Mfg.....ea. $1.95
RT-7/APN-1 Radar Altimeter Receiver.....ea. $9.50
T-85/Apt-5 Radar Jamming Transmitter ea. $65.00
R-23/ARC-5 Command Receiver with Dynamotor.....ea. $12.50
BC-451 Reel Control Box, Veeder-Root Mfg. ea. $.95
PE-104 A Power Converters for the SCR-284 A.....ea. $15.00
CD-501 Battery cable for SCR-284 A.....ea. $2.50
MC-138 Right Angle Drives.....ea. $.95
I-97 A Bias Meter.....ea. $2.50
C-4/ARN-7 Control Box for A. D. F.....ea. $2.95
DM-32 A Dynamotor for SCR-274.....ea. $1.50
DM-53 Dynamotor for I. L. S.....ea. $3.95
211042B Dynamotor, 12 volt Navy type.....ea. $2.95
BC-306 Antenna Tuning Units for BC-375 ea. $2.75
IN-84 Feed-thru Insulators, Heavy Duty 4⅝".....ea. $.60

Flexible Housing for wiring, with female couplings, fits AN connector 10 ft. length $1.50 20 ft. length.....ea. $2.75
Regulator Control Unit, G. E. model 36BB1A22.....ea. $12.50

Terms: Prices Net FOB Chicago. 25% Deposit, balance COD. Send us your requirements.

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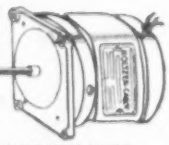
1930 S. State St. Telephone DAnube 6-4476
CHICAGO 16, ILLINOIS

NEW HOLTZER-CABOT TOTALLY ENCLOSED MOTORS

50 R.P.M. Reversible Single Phase Capacitor-Run type. 115 Volts AC 60 cycle 0.3 Amp. Torque 100 oz. inches. ⅜" shaft ⅝" dia. 400 at $19.50 ea. SAMPLE $17.50



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Used for illuminating meters, compass dials, airplane instruments, etc. Soldering iron removes lamp from base to use in models, doll houses, miniature trains, Xmas trees, etc.
Mazda G.E. 323 Mazda G.E. 328
3V 15 A 6V 2A
Either type, doz. $1.50

MARKTIME 5 HOUR SWITCH

A 10 amp. timing device. Pointer moves back to zero after time elapses. Ideal for shutting off radios and TV sets when you go to bed. Limited supply at this special PRICE $3.90

Also available in 15 min. 30 min. 1 hr. at $8.50

ISOLATION TRANSFORMER $1.95

Nat. Known Mfgrs. 50 watt 2 windings, 115 V. to 115 V. 60 cy. Ideal to prevent shocks from small radios and vertical and electronic devices. Shipping Weight 5 lbs.

Other sizes and 220-110 in stock.

Kilowatt Demand Motor Totalizer containing heavy duty TELECHRON B-T, 1 RPM motor and hundreds of watch size gears, clutches, springs, etc. Shipping weight 2 lbs. 5 for $10.00 $2.50

RADAR MAGNETS $5.00 to $17.50
Write for Sizes and Weights.
RCA 930 PHOTO TUBE $1.25
CRYSTAL DIODE IN-21 .35
INSTANT REVERSIBLE 50 RPM SMALL 12V. DC-40 OHM RELAY 5 for $1.00
Sample 50¢
ALLIANCE 9R RUSSEL 110V AC MOTOR. $1.85; 3 for $5.00

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We are Authorized Wholesalers for Micro Switch Corp. and carry the largest stock of Allen-Bradley Potentiometers. Potter & Broomfield Relays. Guardian Electric Co. Solenoids and Relays and Hayden Clock Motors in all speeds. Electric Counters.

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Experimenters and Inventors Supplies

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FREQ. STANDARD, to 40 MC, James Knight type FS-344, excellent condition..... $75.00
SIGNAL GENERATOR, 2-125 CPS, low freq. linear time base generator, Dumont Mod. 219. Near new..... $115.00
FREQ. METER, aircraft type, 350-450 cycles—direct reading—3" flush Mtg. 90-140V, accuracy 1/3 of 1%. Electrodynamometer type—low drain—8VA—Hickok Mod. 89 (list $30.00). New..... $19.00
T.V. SET, large screen (19"x25") projection type, tavern type cabinet, originally cost $1,800.00—reconditioned—excellent condition..... $275.00
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72 OHM LINE, for 1 KV per ft..... .04
CRYSTALS, 120 in box, 8675 KC to 8650 KC in 25 KC steps, FT-243 holder 1935..... $49.00
RC-GF COIL SETS, receiver & Xmitter, used, good condition..... .50

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Single phase full wave bridge type.
6-18V. A-C in, 9-36V. A-C input.
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5 Amps	$3.95	5 Amps	$7.75
10 Amps	$7.75	10 Amps	$14.00
Full wave center tap 10 Amp.			$14.50

Write for our low prices on all other types; discounts on quantities.

CHOKE, 7 Amp., 03 Henry..... $3.50
ARC-5 RECEIVER, 6-8 MC less dial & drive, like new..... $3.95
RED PLASTIC TUBING for 220 wire, 1500 Ft spool..... $4.95

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220/440V. 330 KVA also good for 110V. 220V use, new..... $7.95
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Tubular Condensers	Electrolytic Condensers
Oil Filled Condensers	Mica Condensers
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Switches	Relays
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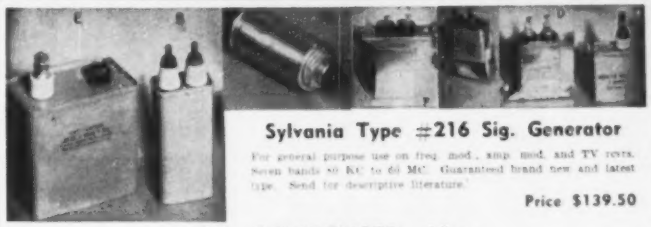
TELEVISION TUBE MACHINERY

8 HEAD MACHINE, for button stems.
TUBE STEM MACHINES Mfd. by Kahle Eng. Co. 4-5-6-7-8 positions with Geneva movements.
HYDROGEN FURNACES Complete with automatic controls, 20" x 7" x 4", Brick-lined, with two Bristol automatic controllers, Brown pyrometers.
EXHAUST MACHINE 32 head, capacity 60 tubes per hour, 60 W. type 3174 Seallex chassis.
VACUUM FIRING EQUIPMENT Mfg. by GE.
SEALING & STEM MACHINE 16 head, mfd. by GE.
EXHAUST MACHINE 16 head, mfd. by GE, can be converted to standard tube production.

Many other items of good, used glass working equipment. Please write for details:

HAYDU BROTHERS
Plainfield, New Jersey



Sylvania Type #216 Sig. Generator

For general purpose use on freq. mod., amp mod. and TV revrs. Seven bands 80 KC to 60 MC. Guaranteed brand new and latest type. Send for descriptive literature.

Price $139.50

OIL CONDENSER—New

Symbol	Cap.	Voltage	Type	Price
B	005-.005-.01	10KV	#26F344	$2.50
I	.007	1,000V	Rev. bkt.	.60
Special	.02	20KV		6.50
F	.03	10KV	#26F380	3.00
B	.05-.05	2,000VAC	#25F648	.95
B	.1	1,500V		.22
G	.1	2,000V		.28
F	.1	2,500V	#2516CB	.40
G	.1	3,500V		.55
B	.1	5,000V		.75
B	.1	7,000V	#25F744	1.00
G	.1	7,000V	Can 1 Term.	.90
B	.1	7,500V	#25F447	1.20
B	.1	10KV	#23F644	4.25
B	.1	15KV	#25F572	5.25
B	.2	10KV	#25F433	6.50
B	.25	3,000V		1.00
E	.25	6,000V	#23F659	1.25
B	.25	20KV		16.95
B	.4	10KV	#14F267	4.75
D	.5	400V	#416MCT	.12
D	.5	500V	#9CB6A3	.14
B	.5	1,500V	Can	.25
B	.5	2,000V		.75
B	.5	3,000V		1.10
B	.5	25KV		19.85
B	.5-.1	2,000V		.99
B	.5-.5	600V		.20
B	.75	1,000V		.17
F	1	400V		.16
D	1	500V	#23F266	.18
F	1	500V	#23F225	.18
F	1	600V	CP65S1EF105	.24
B	1	600V		.20
B	1	1,000V	TJU10010G	.25
B	1	2,500V	#23F121	1.15
B	1	10KV	#14F267	12.95
B	1	15KV		15.75
B	1.25-1.25	7,500V	#23F360	5.75
D	2	600V		.25
G	2	600V	TLA Type	.16
G	2	1,000V	TLA Type	.40
B	2	1,000V		.49
B	2	2,500V	Bkts	2.15
B	2	4,000V	#23F47G2	3.65
B	3	600V	Can	.25
B	3	4,000V		4.50
B	3	500V		.65
B	3-3	500V	#23F798	.44
B	4	500V	#23F317	.45
B	4	600V		.52
B	5	600V		.52
B	6	2,000V		2.90
B	7	800V		.69
F	8-8	600V		.90
B	10	600V		.85
B	10	1,000V		1.95
B	10	1,500V		2.50
B	15	1,000V	TJU10150	2.15

TYPE "J" POTS
$.35

Symbols: LS. Locking Type Shaft. S. Screwdriver. R. Round Shaft

Ohms	Shaft	Ohms	Shaft
50	1 SLS	25,000	1 SLS
200	1 SS	50,000	1 4S
500	1 SS	50,000	1 SS
500	1 2R	50,000	1 1 4R
1,000	1 SLS	50,000	1 SLS
2,000	1 SLS	100,000	1 SLS
3,000	1 SLS	100,000	1 0R
3,000	1 2R	100,000	1 4S
5,000	1 SLS	150,000	2 1 SR
5,000	1 4R	200,000	1 SLS
10,000	1 SLS	200,000	1 2S
10,000	3 SR	250,000	1 SLS
15,000	1 SS	250,000	1 SS
16,000	1 SLS	500,000 (2 Terms)	1 SS
20,000	1 SLS	1 Meg	1 SLS
20,000	1 1 4R	1 Meg	1 SS

TYPE "JJ"
$.70

Ohms	Shaft	Ohms	Shaft
1500	1 4R	100K	1 2LS
1K-5K	1 SR	100K	33 SLS

Available in other sizes

NEW MICA CONDS.

6, 15, 25, 30, 39, 75, 100, 140, 150, 185, 200, 230, 240, 250, 300, 350, 400, 500, 750, 1000, 1250, 1300, 1500, 3000, 3800, 4700, 5000, 6000 and 10,000 mmfd @ 500V. $5.50 per "C". Special, 100 assorted $2.95.

NEW S. MICA CONDS.

10, 20, 30, 50, 100, 125, 140, 150, 200, 240, 250, 300, 345, 400, 500, 670, 1000, 1800, 2000 and 2500 mmfd @ 500V. $7.00 per "C". Special, 100 assorted $5.95.

BATHTUB KIT 10 for 5.99

For Bathtub Conds. see Mar. issue.

SPECIAL
5—5 mfd—400 vdc Oil Cond.

2 terms, hor. mntg flanged type. Dimensions 2⅝ x 3⅛ x 2. Tested at 1800 V. Meets commercial specs. for 600 Volt operation up to 40 degrees C. Being used as power factor correction capacitors. Numerous applications. 24 per carton. See symbol "F".

Price..... **$.39** each

Price F.O.B., 25% with order. Balance C.O.D. Minimum order $2.00.

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BOX 159 OAKHURST, N. J.

ALLIED TYPE 90 RELAYS
55 VAC DPDT. Operates on 12 VDC or 110 VAC intermit. duty 15 min., 2 units in series for 110 VAC to 4PDT open. #R211 $1.10 ea.
190 6H29 6 VDC DPDT 14.2 ohms. #R212 $1.10 ea.
BOX 1464 24 VDC DPDT 230 ohms. #R04 ..$.89 ea.
BO-135035 24 VDC SPST No Ibbie Br 230 ohms. #R06 $.79 ea.

Over 100,000 Relays in Our VAST STOCK

GUARANTEED—IMMEDIATE DELIVERY
Write us your needs for our quote

Write for Our Quote

SOLENOIDS

G. E. CR9533K100A2 240 ohm 24 VDC DPST N.C. & SPST N.O. 2 switchettes. Extra Long Throw. #R132 ..$6.60
HART M569A CAT # 6941H18 75 ohm 24 VDC 200 amp. cont. SPST N.O. #R127A ..$1.75

H-F TIE POST
LOW LOSS BAKELITE INSULATION
$7.50/C $67.00/M

LARGE STOCKS OF AN Connectors

SINE - COSINE - SQUARE WAVE POTENTIOMETER W.E. CO# D166100 for very low freq. sweep circuits
$9.95 ea.

APC's, Binding Posts, Cable, Capacitors, Ceramicons, Ceramics, Chokes, Circuit Breakers, Coils, Controls, Crystals, Filters, Fuses, Hardware, Knobs, Relays, Resistors, Shock-Mounts, Sockets, Spaghetti, Switches, Transformers, Tubes

Write Us Your Needs for Immediate Quote

6.8 WHITE DENTAL LAB RESISTORS 1K, 4K, 60K, 100K, 500K. All 1 Watt $7.50/C

Min. Order $2.50

Universal general corp. Prices Net F.O.B. Our Plant
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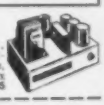
SOUNDTRONICS SPECIALS

JUNE SPECIAL
1B-110 TWISTED PAIR TEL. FIELD WIRE Stranded 4 Steel, 3 Copper, Weatherproof
¼ MI. Reel..... $ 5.00
1 MI. Reel..... 10.00

TRANSFORMER POWER SUPPLY



115 V. 60 Cy., 300 V. @ 55 MA. 6.3 V. @ 3 Amps. Has 5Y3, 2-8 Hy. Chokes, 3-30 MFD Filters, Pilot, Term. Strip, Meas. 5"x7"x6". Completely wired **$6.85**

6 V. 12 Amp. TRANSFORMER 115 V. @ 60 Cy. Inp., Open Frame 2¼"x3"x3¼"..... $1.66

TG 10 KEYERS w/TUBES $24.95

ANTENNA INSULATOR
Heavy Glazed Porcelain
13"x1"x1⅛" ..... 10¢

SELENIUM RECTIFIERS
Single Phase Full Wave Bridge

Input 0—18 volts	Output 0—14 volts
2.4 Amps.	$4.07
6.4 Amps.	$4.09
13 Amps.	$7.67
17.5 Amps.	$8.69

WHEATON TRONEX TERMINALS

#1301 for Circuits up to 5000 Volts 10¢ ea.
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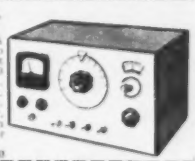
U.T.C. CHOKES P.A. STYLE

10 HY. @ 65 MA. 400 ohm DC. R.	$ .97
10 HY. @ 110 MA. 80 ohm DC. R.	1.40
10 HY. @ 150 MA. 130 ohm DC. R.	2.25
5 HY. @ 150 MA. 120 ohm DC. R.	1.85

OUTSTANDING VALUE
New Army MINE DETECTOR AN/PRS-1 Will detect metallic and non-metallic objects, buried cables, etc. Uses 3- 45 V. & 1- 6 V. Batteries. Complete w/spare rods, tubes, etc. Less Batteries. In Original Overseas Packing $16.95

FOLLOWING EQUIP. USED BUT LIKE NEW

U.H.F. SIGNAL GENERATOR



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BC 716A—680—710 M.C. Rec. & Reg. Pwr. Sup. Part of SCR 296 RADAR 16 Tubes $138.00

TRANSTATS—3.9 KVA 1 Phase 50/60 cy fixed winding 115/230 V. output 0-260 V. Max. amps. 15 ..... $42.00

5.85 KVA 1 phase 50/60 cy. fixed winding 115/230 V., Output 0-260 V., Max. amps. 22.5 ..... $52.00

DUAL LINE LEVEL RECORDER +6 to —16DB. 115 V. 60 Cy. Made by Brown Instrument. $155.00

LARGE QUANTITY OF SEMI-PRECISION FACTORY TEST EQUIP. Pulse Gen., Pulse amp., Multi-Vib., Sig. Gen., Wavemeters., Delay lines, etc. Write requirements.

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CLARE STEPPING SWITCHES

Type SD-14, 20 steps, 6 levels. Coil 13V, DC. Lists at $40.26; our low price $13.00. Brand new in original boxes—not war surplus. Quantities of four or more, $12.25 each. Satisfaction guaranteed or money refunded.

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"TAB" THAT'S A BUY TUBES Tested—Guaranteed

OA2 1.39	2C43/6L4A 9.39	6AD6G .81	6SD7GT .45	12F5 .95	35Z4GT .49	417A 19.95	CK1005 .18	Tuner Bulb 6
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1A5GT .48	2G5 .98	6AL7 1.00	6SS7 .57	12SF5GT .54	45Z3 .54	530 12.95	1614 1.42	PM5 .98
1A6 .78	2J21 11.45	6AN5 1.19	6ST7 .75	12SF7GT .52	45Z5 .51	531 .98	1616 .79	PM6 .98
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1B23 9.00	2J34 17.50	6AT6 .67	6V6GT .60	12SQ7GT .52	50B5 .54	575A 975 12.65	1642 .89	K55B .36
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1B37 65.00	2J50 39.00	6AW6 .89	6W7G .87	HY69 4.95	51 .84	WL632A 8.98	2342 16.00	2B563 9.98
1B38 .36	2J56 81.00	6B4G .84	6X4 .52	7B7 .74	53 .84	701A 2.90	5514 4.85	Mazda Pilots
1B41 49.95	2J61 39.00	6B6G .84	6X5GT .42	7B8 .77	56 .79	702A 702B 2.75	5516 5.85	44, Box 10 .50
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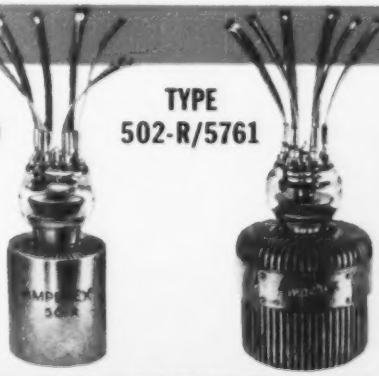

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. . . a major advance in studio-type image orthicons

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electronics

MID-MONTH
JUNE 1950

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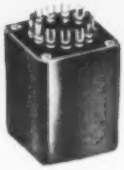

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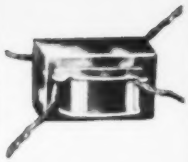

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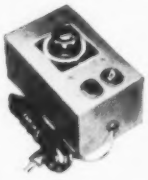

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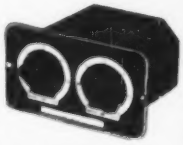

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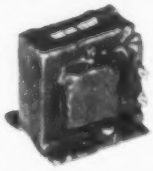

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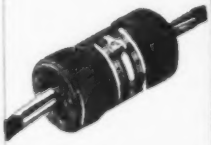

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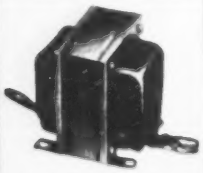

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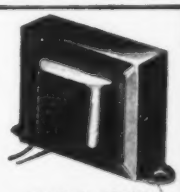

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FOREWORD

This is *your* Buyers' Guide—its contents and format determined by extensive survey among the subscribers to ELECTRONICS.

It is an *extra*—a bonus edition designed for service at your elbow throughout the next twelve months.

In it we are publishing the most complete directory, as to diversity of products, which has yet been presented.

In addition we have done an earnest job of preparing editorial reference material designed to help you repeatedly in your work.

Many advertisers have seen fit to utilize these pages to describe and catalog their products. It is our hope that this combination of buying-source listings, product advertising and reference material constitutes a service which will further strengthen our position with you, the subscriber.

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NOW *is the time . . . .*

TO INCLUDE THE 1951-52

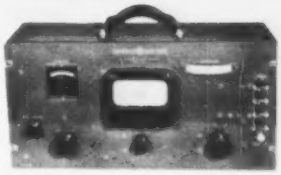
ELECTRONICS BUYERS' GUIDE

IN NEXT YEARS' ADVERTISING BUDGET

GENERAL ELECTRIC

ELECTRONIC RESEARCH, ENGINEERING & MAINTENANCE EQUIPMENT

The high quality test equipment shown here is only a small segment of the entire group offered by General Electric. A detailed description of all G-E measuring units is included in the catalog listed at the bottom of this page.



TYPE YPD-2
REGULATED POWER SUPPLY

This G-E Regulated Power Supply is a superior quality, medium power, electronically regulated unit designed for use in laboratories, broadcast stations, and wherever a closely regulated d-c voltage of low ripple content is required.

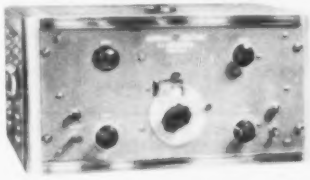
SPECIFICATIONS		OTHER UNITS AVAILABLE
DC Voltage Output 250-450 v	• YPD-4:	160-1500 v. Current: 0-125 ma.
DC Current Output 0-300 ma	• PS-4:	Dual power supply, each unit supplying 250-400 v. Current: 0-400 ma max.
	• 45T1A1:	180-300 v. Current: 0-60 ma.

TYPE YKS-1
RADIO FREQUENCY RESISTANCE METER

A direct-reading precision instrument for rapid, accurate measurement of RF resistance of radio components and circuits. Operates over exceptionally wide range of 50 kc to 80 mc, and from 0 to 200 ohms. Adaptable for measurement of such constants as RF resistance of ordinary coils, capacitors, transmission lines and antennas, or even complex combinations of such devices. F, C and R are read directly. Reactance and Q determined from simple nomograph.

SQUARE WAVE GENERATOR TYPE YGL-1

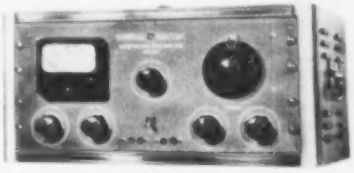
- Wide frequency range: 5 to 125,000 cycles.
- Output voltage 0-75 volts.
- Low output impedance.
- Rise time .3 microsecond.



CAPACITOMETER TYPE YCL-1

G-E r-f capacitometer is a convenient, self-contained unit for rapid and extremely accurate measurement of . . .

- Capacity: 0-20,000 micromicrofarads.
- Inductance: 0-10,000 microhenries.



DISTORTION AND NOISE ANALYZER TYPE YDA-1

A precision instrument designed especially for broadcast and laboratory use. Whenever information is required on distortion, audio noise, or hum, the YDA-1 will provide accurate measurement down to extremely low levels.

TYPE YNA-4

G-E INDUSTRIAL TEST EQUIPMENT

INDUSTRIAL OSCILLOSCOPE

For applications where test equipment is essential for installation and maintenance purposes. Insulated case, sturdy construction, versatile circuits with D-C amplifiers, and good magnetic shielding recommend this oscilloscope for use in industrial and educational laboratories and for production testing.

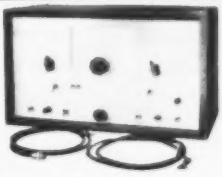
INDUSTRIAL TUBE ANALYZER

This portable equipment is designed so that non-technical personnel can quickly and efficiently determine the performance of mercury vapor and gas rectifier tubes by measuring the arc drop voltage under load. The periodic testing of rectifier tubes can help prevent equipment failure and loss of operating time.

TYPE YTM-1

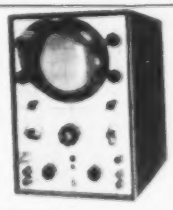
TYPE SN-3A POCKET CHAMBER ELECTROMETER

An extremely high-quality, self-balancing electrostatic potentiometer. A standard 3-inch meter provides direct measurement in two ranges—50 and 250 mr for rapid, accurate reading of "pencil" type pocket ionization chambers.



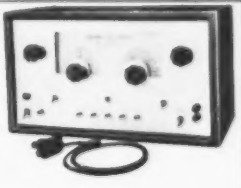
TYPE ST-5A
MARKER GENERATOR

For use with wideband sweeps. Permits employment of multiple markers simultaneously. Separate crystal for each TV channel. No tuning required. Individually calibrated dial for IF (20—50) mc range. Dial can be mechanically indexed at crystal calibration points.



TYPE ST-2A
OSCILLOSCOPE

A new, general purpose oscilloscope. Wide frequency response—from DC to 500 kc, and with gradually reducing response to higher frequencies. High sensitivity. Sturdy construction. Voltage calibrator, Z-axis input, and DC input coupling to vertical amplifier.



TYPE ST-4A
SWEEP GENERATOR

Sweep Generator Type ST-4A. Provides at least 15 mc wide linear sweep. Double shielding holds leakage to minimum. The output voltage is greater than 0.1 volts from 4—110 megacycle, greater than 0.5 volts from 170—220 megacycle.

TYPE SN-1A BINARY SCALER

Provides scale of two in self-contained unit that cuts installation and maintenance to a minimum. Permits flexible installations for industrial counting, interval timing, repeat cycling, photographic printing.

- High Speed . . . Up to 200 KC
- Adequate Resolution . . . 5 microseconds

Send for This
FREE CATALOG

Complete specifications, descriptions, charts and photographs of G-E electronic test equipment, quartz and germanium crystals. Write: *General Electric Company, Commercial Equipment Div., Electronics Park, Syracuse, New York.*

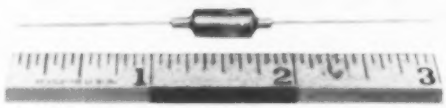
WRITE G-E COMMERCIAL EQUIPMENT DIV., ELECTRONICS PARK, SYRACUSE, N. Y., for Complete Details or Bulletins

GENERAL ELECTRIC

G-E WELDED GERMANIUM DIODES

WELDED CONTACT LOW SHUNT CAPACITY INSULATING CASE

1. WELDED CONTACT provides greater shock resistance, improved electrical stability.
2. LOW SHUNT CAPACITY .8 MMFD max. for all types.
3. INSULATING CASE simplifies mounting. Mechanically sturdy.
4. SMALL SIZE for "close fits."



5. LONG LIFE: an estimated minimum average life of 10,000 hours.
6. NO HUM—no heater connections—no heating power—no heat.
7. IMPROVED RECTIFICATION CHARACTERISTICS—Has much sharper bend in current/voltage curve than Thermionic Tube.
8. HIGH MOISTURE RESISTANCE.
9. SELF-HEALING under temporary overvoltage conditions.

ELECTRICAL CHARACTERISTICS — (at 25° C.)

DESIGNATION RMA	GE	MAX. INVERSE CURRENT (MA) AT —50V	MAX. INVERSE CURRENT (MA) AT —10V	MINIMUM FORWARD CURRENT (MA) AT + 1V	AVERAGE SHUNT CAP. (MMFD)
GENERAL PURPOSE					
1N51	G5C	1.667		2.5	0.8
1N48	G5	.833		4.0	0.8
1N52	G5D	.15		4.0	0.8
1N63	G5E	.05		4.0	0.8
TELEVISION					
1N64	G5F	Min. 100 microamps dc load current in specific 44 MC second detector circuit.			
1N65	G5G	.20		2.5	0.8
UHF					
	G7	Noise figure 14 to 19 db in specific 500 MC converter circuit.			
JAN					
1N69	G5K	.85	.05	5.0	0.8
1N70	G5L	.41	.01	3.0	0.8

MAXIMUM RATINGS

DESIGNATION RMA	GE	PEAK INVERSE VOLTAGE AT 25° C	CONTINUOUS REVERSE WORKING VOLTAGE AT 25° C.	AVERAGE RECTIFIED CURRENT (MA) AT 25° C	PEAK RECTIFIED CURRENT (MA) AT 25° C	MAXIMUM SURGE CURRENT (MA) AT 25° C	AMBIENT TEMPERATURE RANGE
GENERAL PURPOSE							
1N51	G5C	50	40	25	100	300	—50 to + 75° C
1N48	G5	85	70	50	150	400	—50 to + 75° C
1N52	G5D	85	70	50	150	400	—50 to + 75° C
1N63	G5E	125	100	50	150	400	—50 to + 75° C
TELEVISION							
1N64	G5F	20					
1N65	G5G	85	70	50	150	400	—50 to + 75° C
UHF							
	G7	5		25			
JAN							
1N69	G5K	75	60	40	125	400	70° C Max.
1N70	G5L	125	100	30	90	350	70° C Max.

IN ADDITION—

MATCHED PAIRS of general purpose types—forward currents within 10% of smaller current at + 1 volt

QUADS—Type G-9—Four carefully matched diodes for ring or bridge modulators mounted and hermetically sealed in 6H6 tube shell

TRANSISTORS—Type SX-4A—Tested for 13 to 20 db power gain at 5 kc. Type Z-2—Tested for reverse current characteristics suitable for trigger circuits

NEW HANDBOOK • Vital Facts for Electronics Designers, Engineers and Manufacturers

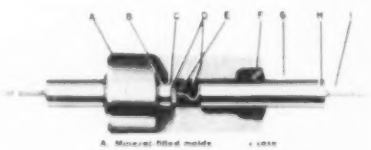
Here are 68 pages of up-to-the-minute information about diodes and their applications in today's widening electronics market. Complete with charts and drawings, it shows you diode characteristics, curves on resistance, voltage, temperature, efficiency, circuit diagrams covering AM, FM, and TV receivers, measuring equipment, radar, and corrosion current . . . plus time-saving tips on how to install, check, and inspect diodes in electronic equipment. Written by General Electric engineers at Electronics Park, the book is assembled in loose leaf fashion for practical use in laboratory or shop. Supplementary sheets on new diode developments will be sent to you as they are published—and at no extra cost.

Worth many times its modest price, this handbook is yours for $1.25 postpaid. Send check or money order to: General Electric Company, Section B60, Electronics Park, Syracuse, N. Y.

WELDED CONTACT

For Stability

—It's The POINT That Counts



A. Mineral filled molde
B. Solder
C. Germanium Pellet
D. Welds
E. Platinum—Ruthenium Whisker
F. Thermosetting Cement
G. Nickel Pin
H. Weld
I. Leaded Copper Wire

In a General Electric diode, the use of a platinum whisker permits actual welding of the fine contact point to the germanium. This results in a mechanically secure contact free from shock or vibration variations. Wax filling is not necessary in this type of construction; no impurities can touch the most vital point of a semi-conductor diode.

For complete information, see your local G-E representative, or write: General Electric Company, Section B60, Electronics Park, Syracuse, New York.

WRITE G-E COMMERCIAL EQUIPMENT DIV., ELECTRONICS PARK, SYRACUSE, N. Y., for Complete Details or Bulletins

GENERAL ELECTRIC

COMPONENT PARTS

Electronics Park, Syracuse, New York

DEFLECTION YOKES

77J11 series

For use with picture tubes having scanning angles up to and including 70°. Provide efficient uniform deflection. Available with ribbon type laminated core or ferrite core.

ELECTRICAL RATINGS:

Horizontal winding: 17 mh (laminated core), 17 mh (ferrite core).

Vertical windings: 40 mh.

Mechanically interchangeable with other leading makes of yokes.

G-E TELEVISION COMPONENTS

G-E Television Components feature Focus-Deflection Assembly, Horizontal Output Transformer and Ion Trap. These G-E Television Components, the result of twelve years of research and experimentation, play a vitally important part in providing clearly-focused, precise television reproduction.

WIDTH and LINEARITY CONTROLS

77J4 and 77J9 series

A complete line of width and linearity controls for use with the other General Electric scanning components. Models with pulse windings available. Also may be used with other leading makes of scanning components.

FOCUS COILS

77J3 and 77J7 series

Combine effects of Alnico 6 permanent magnet and an electromagnet to provide uniform focus with a minimum of circuit power.

This type of focus coil compensates partially for variations in focus caused by line voltage fluctuation.

A complete line of models available to focus all standard picture tubes.

ION TRAPS

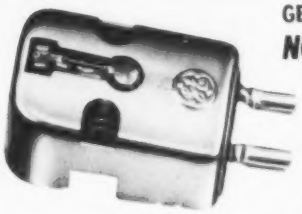
77J8 series

Single magnet type available in densities of 20 to 50 gauss. For use with picture tubes from 8½ to 19 inches except those models requiring double magnet type ion traps.

HORIZONTAL SWEEP TRANSFORMERS 77J1 series

Ferrite core high efficiency transformers for all designs of economical, high quality picture tube scanning circuits. When used with General Electric 77J11 series or other high efficiency yokes, these transformers provide 70° deflection at 13 kv utilizing the new small tubes such as 6AV5, 1X2, and 6W4.

Available complete with 1 X 2 socket and wiring for compact economical installation.



GENERAL ELECTRIC VARIABLE RELUCTANCE CARTRIDGES

***NOW,* WITH THE "BATON" STYLUS** A full line of Variable Reluctance Cartridges is available, including single stylus cartridges for standard and microgroove records and the famous Triple Play Cartridge that plays all three speeds, 33⅓, 45 and 78 rpm, without changing its position in the tone arm. Both single stylus and Triple Play Cartridges are available in a special low impedance model for professional and broadcast users.

All diamond and sapphire styli are now built to the "Baton" design, a new G-E achievement affording unusually high fidelity. The double twist feature of the "Baton" Stylus makes possible new heights in compliance while dual damping blocks filter out spurious vibrations.

GENERAL ELECTRIC ALNICO 5 LOUDSPEAKERS WITH THE ALUMINUM BASE VOICE COIL

Cat. No.	Speaker Size Inches	Watts Output	Alnico 5 Mag. Wt. Oz.	VC Imp. Ohms	Response Cycles	Cat. No.	Speaker Size Inches	Watts Output	Alnico 5 Mag. Wt. Oz.	VC Imp. Ohms	Response Cycles
400D	4	4	1.3	3.2	140-7000	810D	8	12	6.8	3.2	80-10000
402D	4	4	1.0	3.2	140-7000	818D	8	12	6.8	8	80-10000
403D	4	4	.68	3.2	140-7000	1000D	10	12	6.8	3.2	60-7000
500D*	5	4	1.3	3.2	125-8000	1001D	10	25	14.5	8	60-8000
503D*	5	4	.68	3.2	125-8000	1003D	10	25	9.0	8	60-8000
525D	5¼	4	1.3	3.2	120-7000	1012D	10	12	3.16	3.2	60-7000
526D	5¼	4	1.0	3.2	120-7000	1018D	10	12	6.8	8	60-7000
527D	5¼	4	.68	3.2	120-7000	1200D	12	12	6.8	3.2	60-8000
625D	6½	4	1.3	3.2	110-9000	1201D	12	25	14.5	8	50-13000
626D	6½	4	1.0	3.2	110-9000	1203D	12	25	9.0	8	50-13000
650D	6½	8	2.98	3.2	100-10000	1212D	12	12	3.16	3.2	60-8000
703D	6 x 9	8	1.47	3.2	70-13000	1218D	12	12	6.8	8	60-8000
800D	8	8	2.98	3.2	80-11000						
Special Construction for Drive-in Theatre Application											
400C22	4	4	1.3	3.2	180-7000	525C18	5¼	4	1.3	3.2	160-7000

Chassis mounting brackets—at no additional cost—with all 4", 5", and 5¼" G-E speakers.
*Round speakers.

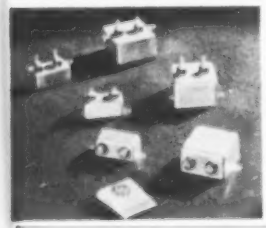
WRITE G-E PARTS SECTION, ELECTRONICS PARK, SYRACUSE N. Y., for Complete Details or Bulletins

G-E CAPACITORS

A-C CAPACITORS

Small a-c Pyranol* capacitors are recommended for use with motors, industrial control, specialty transformers, and other equipment. Use of Pyranol as a treating material, because of its high dielectric strength, high permittivity, and exceptional stability, has made possible a marked reduction in physical size, as well as a far superior capacitor. Three styles of mounting brackets are available and supplied separate from the units. Units may be operated in any position. Write for Bulletin GEA-2027.

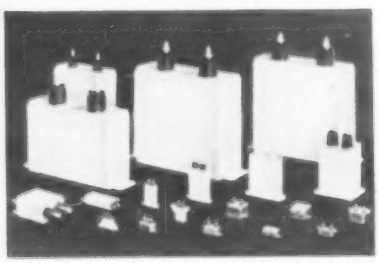
STANDARD RATINGS				
Rated Voltage 60 cycle	CASE STYLES Fabricated rectangular	Drawn rectangular	Drawn cylindrical	Drawn oval
236	1.20 muf	14.5		2.15
275		14.5, 17.5		
330	1.50 muf		1.25-12 muf	2.4.8
440	1.28 muf	10 muf		3
660	1.15 muf		1.75, 1.85	1.75



D-C CAPACITORS

These Pyranol* capacitors are designed for commercial electronic applications, ranging from the small units for blocking and by-pass service to large capacitance units for power supply filters, and high voltage units for use in heavy duty X-ray equipment. Write for Bulletin GEA-2621.

STANDARD RATINGS		
Case styles	Voltage	Capacitance
40	600-1500	.25-4 muf
50, 51, 52	100-1000	0.5-4 muf
60, 62, 64	400-1000	1.0-2 muf
66, 68	600-1000	0.1-1 muf
70	400-100,000	0.1-75 muf



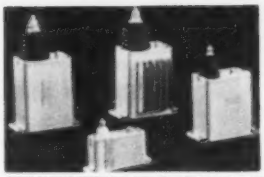
JAN-C-25 SPECIFICATIONS

Intended primarily for filter, by-pass and blocking purposes, these capacitors are for use in equipment required by the armed forces. The specification qualifies these units for applications where the a-c component of the impressed voltage is small with respect to the d-c rating. Write for Bulletin GEA-4357.

STANDARD RATINGS		
Case styles	Voltage	Capacitance
CP40	600-1500	.25-4 muf
CP53 —54 —55	100-1000	05-4 muf
CP61 —62 —63	400-1500	01-1 muf
CP67 —68	600-1000	01-1 muf
CP70	600-12500	0.1-15 muf

HIGH FREQ. CAPACITORS

High frequency paper dielectric capacitors are designed for grid and plate blocking service in the electronic oscillator circuits of high-frequency induction heating equipments. They may also be used advantageously in other high-frequency oscillator circuits of a similar nature. Write for Bulletin GEA-4388.



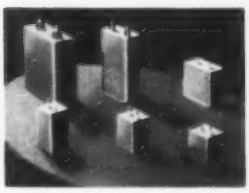
STANDARD RATINGS	
Microfarad rating	D-C voltage rating
.01	5000
	15,000
	20,000

HFP CAPACITORS

These high-frequency, liquid-filled, parallel-plate capacitors have been specifically designed for use in the resonant circuit of high-frequency electronic oscillators, such as those used in electronic heater applications. They may be operated at relatively high voltages and will carry heavy currents continuously at frequencies of 50 kilocycles to several megacycles. Write for Bulletin GEA-4365.

STANDARD RATINGS		
Max. permissable RMS working volts	Microfarad rating	Max. permissable RMS working current in amp. at 540 kc
2500	.027	229
3000	.0215	217
4000	.017	231
4500	.014	214
5500	.0105	196
6000	.008	163
7800	.0076	201
	.006	159
9000	.0054	165
	.0042	128
11000	.0037	139
	.0029	109

* Trade Mark Reg. U. S. Pat. Off.

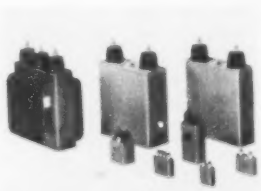


ENERGY STORAGE AND DISCHARGE

These d-c Pyranol* capacitors for phototube and similar light-duty energy storage applications are the result of years of experience in the design and manufacture of capacitors for this type of service. They are relatively light weight, small, stable capacitor having a life consistent with the application involved. Write for Bulletin GEA-4646.

PULSE-FORMING NETWORKS

These capacitor pulse-forming networks, type E, are for applications in radar and industrial equipment where the normal (exponential) capacitor discharge shape is not suitable and where an impulse having a definite energy content and duration is required. Write for Bulletin GEA-4996.



WRITE G-E APPARATUS DEPT., SCHENECTADY, N. Y. for complete details or Bulletins

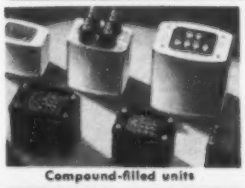
GENERAL ELECTRIC

G-E SPECIALTY TRANSFORMERS FOR ELECTRONIC EQUIPMENT

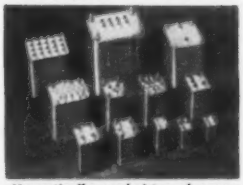
The Specialty Transformer Division of the General Electric designs and manufactures transformers for virtually all electronic applications except those for home radio and television receivers. It has been the general practice to design and build transformers to individual specifications rather than offer a so called "standard line" from which the most suitable model could be selected and adapted to the application. In this unusually progressive field, custom designed-precision-built transformers offer the user greater flexibility in the design of his equipment, better space utilization, faster assembly, and ultimately a higher degree of satisfaction.

Included among the thousands of models in our active files are custom designed ratings ranging in size from ¾ ounce to hundreds of pounds. The most common units in current production are: plate transformers (both single and three-phase), filament transformers (including the high-reactance design), plate and filament transformers, filter reactors, and pulse transformers. Most of them can be designed in any of the construction styles described below. In addition, many units are designed for higher operating temperatures, utilizing Silicone, for use where minimum size and weight is paramount.

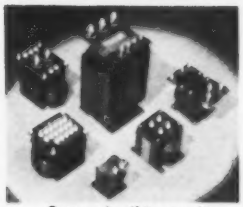
You are cordially invited to contact our representatives for additional information, or for assistance in your transformer requirements. Our vast experience in designing and building transformers for electronic applications particularly those of a complex nature, may well serve you advantageously. You may wish to have a catalog, listing and describing many of these units. Ask for Bulletin GEC-481.



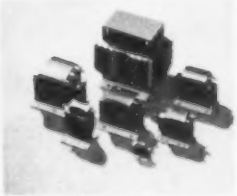
Compound-filled units



Hermetically sealed transformers



Core-and-coil type units



Permafil Type Transformer

CONSTRUCTION TYPES

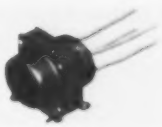
COMPOUND-FILLED Particularly suitable for applications where moisture or humidity is excessive. For such applications, they are far superior to core-and-coil units. If immersion-proof unit is not required, they are more economical than hermetically sealed transformers. They have wide application in the electronics field, such as in frequency-modulation, carrier-current, and speech-input equipment. An especially useful feature is the universal mounting — the units can be top or bottom mounted for open or underdeck wiring.

HERMETICALLY SEALED Protected, internally, from the effects of changing atmospheric pressure, and insulation breakdown due to humidity, and, externally, from corrosion caused by salt-water vapor. Withstands successfully the rigorous salt-water immersion and salt-water spray tests as specified by the Signal Corps, the Air Forces and the Navy. The hermetically-sealed units are specified as standard iron-core components for such apparatus as aircraft receivers and transmitters, UHF equipments, and landing-boat receivers. Furnished with terminals and mounting studs located either on the top or bottom.

CORE AND COIL Usually applied where moisture resistance is not an important factor, and where size and weight must be kept to a minimum. Composed of automatically wound coils imposed on finest-grade silicon steel core laminations, they are the same uniform, high quality as our encased transformers. Made to exacting tolerances to provide excellent electrical characteristics. Terminal boards top or bottom mounted, or with leads, and with mounting studs or brackets to meet special requirements.

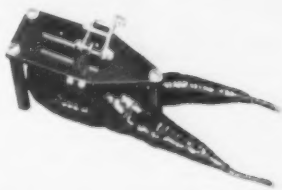
PERMAFIL TYPE For electronic applications. They utilize a special core-and-coil construction which permits size and weight advantage comparable to, and in many instances, better than conventional core-and-coil unit. Completely protected by a tough coating of Permafil (a synthetic resin developed by G-E) which makes them highly moisture resistant. Particularly adaptable to aircraft use where size and weight requirements are extremely critical.

GOOSENECK FILAMENT TRANSFORMERS are used as components of radar and transmitter equipment, and allied devices which require high operating voltages above ground. Construction type shown in the photograph permits a substantial reduction in size and weight —critical factors in many installations. A cost savings is also effected over similar ratings of enclosed type construction.



CONTROL AND SIGNAL TRANSFORMERS

Designed to supply low-voltage circuits for economical operation of many types of electronic equipment. Bulletin GEA-1358.



ARC-BACK INDICATORS are designed for use with tube rectifiers to indicate a reversal of direct current. When an arc back occurs, and the direct current flows in the opposite direction, the magnetic field which ordinarily holds the indicator in a horizontal position is neutralized. This permits the indicator to spring to a vertical position, thus indicating a reversal in the drectiion of the direct current. The indicator can be connected to a switch for audible indication rather than visual, to fit certain applications.

AUTOMATIC VOLTAGE STABILIZERS

The necessity of maintaining a constant-voltage supply is highly important in the operation of electronic equipment. For this purpose, General Electric builds an extensive line of automatic voltage stabilizers ranging in size from 15 va to 5000 va.

All voltage fluctuations between 95 and 130 volts are automatically leveled out. Stabilization is virtually instantaneous, and within ± 1 per cent for fixed, unity-power-factor loads. These stabilizers have no moving parts, and require virtually no maintenance. Bulletin GEA-3634.

MAGNETIC AMPLIFIER

The General Electric Amplistat, or self-saturating magnetic amplifier, is a static device incorporating saturable reactors with highly specialized characteristics, and metallic rectifiers as its basic components.

Saturable-reactors are commonly used for the control of a-c power and are built in a wide range of sizes. The Amplistat, a high-gain device, is normally used to amplify weak signals to the power required to operate solenoids, meters, Amplidyne fields, generator fields, saturable-reactor fields, indicating lights, or heating elements.

A two-stage Amplistat, for example, will amplify a thermocouple singal change of 10 microwatts to an output change of 200 watts. It can be designed for virtually any gain that is required. It should be noted, however, that gain and response are interrelated in inverse proportion and that one has to be sacrificed somewhat in applications in which the other is of predominant importance.

WRITE G-E APPARATUS DEPT., SCHENECTADY, N. Y. for complete details or Bulletins

G-E ELECTRICAL INSTRUMENTS

SMALL PANEL—2½ inch . . . General-purpose, small panel instruments for use in radio and communications equipment where compactness (particularly minimum depth behind the panel) is essential. Available in a variety of ratings: Type DW-71 voltmeters, ammeters, milliammeters, and microammeters for measuring of d-c voltage and current • Type DW-72 ammeters and milliammeters for measuring radio-frequency current (ac-) • Type DW-73 voltmeters, milliammeters and microammeters for measuring audio-frequency current (a-c).

DIRECT CURRENT, TYPE DW-71			THERMOCOUPLE, TYPE DW-72		A-C RECTIFIER, TYPE DW-73	
TYPE	RATING RANGE	APPROX. RESIST. RANGE OHMS	RATING RANGE	APPROX. RESISTANCE RANGE OHMS	RATING RANGE	APPROX. RESISTANCE RANGE OHMS
AMMETER	1 to 300 amps.	.00167 to .05	1 to 20 amps.	.012 to .29	1 to 15 ma.	100 to 660
MILLIAMMETER	1 to 500 ma.	.100 to 25	100 to 800 ma.	.48 to 6.8	1 to 15 ma.	100 to 660
MICROAMMETER	50 to 7750 μa.	51.5 to 2030	Primarily for measurement of r.f., a-c in radio or other electronic circuits. Indicates antenna current in radio transmitters; applications include television transmitters, radar, and wave meters.		200 to 750 μa.	900 to 3700
VOLTMETER	1 to 200 v.	100 to 40000			1 to 500 v.	2000 to 500000
VOLTMETER 1000 Ohms per V	1 to 800 v.	1000 to 800000			For testing equipment on electronic circuits, volume-level indicators in communications equipment.	
KILOVOLTMETER	1 to 5 kv.	1000000 to 5000000				

VU VOLUME-LEVEL INDICATOR Type DO-61

A Standardized Volume-level Indicator for Radio Broadcasting, Sound Recording, and Communication Systems. In addition to possessing highly desirable characteristics for broadcast monitoring, and db measurements of loss or gain in transmission circuits and amplifiers, the instruments are recommended for use in sound recording, and for harbor craft communications and other applications where signal-level measurements are to be made.

ADVANTAGES – Standardizes measuring – makes possible better correlation between results of different observers • In many instances it permits more efficient use of facilities • Allows more effective monitoring • Motion of pointer easier to follow • Peaks easier to obtain • Reduced eyestrain as a result of long scale, simplified scale plate and contrast between colors employed, pointer construction and optimum dynamic characteristics • Accurate over wide range of frequency.

TIME METERS — Type KT For use on machine tools, radio transmitters, welding machines, etc., where it is desirable to have a record of utilization. Used on radio transmitters to indicate tube life, it matches that of other panel instruments. Available in 3 forms: panel or switchboard mountings, portable, and conduit mounting. Can be furnished to match operating characteristics of various machines and to record operating time in hours, tenths of hours, or minutes. Time meter is furnished in a molded Textolite* case similar to the miniature 3½ inch instrument to match and harmonize with other instruments mounted on the panel or switchboard. 2 styles available; round and square. Leads provided for easy wiring. Smaller size for panel mounting. Requires same space for mounting as small panel instruments. For permanent installation, time meter is furnished in a drawn steel case, designed for ease in mounting in any convenient conduit or junction box. For portable use, a pedestal mounting is supplied. Write for Bulletin GEA-3299.

*Trade Mark Reg. U. S. Pat. Off.

SWITCHBOARD INSTRUMENTS – General Electric switchboard instruments include voltmeters, ammeters, wattmeters, frequency meters, power-factor meters, varmeters, synchroscopes, temperature meters, and ground detectors. Pertinent data and listings for the more common devices are presented in this publication, although instruments of other ratings and constructions are also available: for example, thermocouple types for the measurement of h-f current or rectifier types for high sensitivity a-c measurements.

A-C TYPES	RANGE	OPERATING PRINCIPLE	CYCLES	ACCURACY
VOLTMETER	10-750 v.	Attraction-Repulsion	25-125	± 1 per cent
AMMETER	1-10 a. self-contained, otherwise limit is limit of C.T.	Attraction-Repulsion	25-125	± 1 per cent
D-C TYPES				
VOLTMETER	1-750 v.	Perm. Magnet, Moving Coil		± 1 per cent
AMMETER	1-3000 a.	Perm. Magnet, Moving Coil		± 1 per cent
MILLIAMMETER	1-750 ma.	Perm. Magnet, Moving Coil		± 1 per cent
MICROAMMETER	100-750 μa.	Perm. Magnet, Moving Coil		± 1 per cent

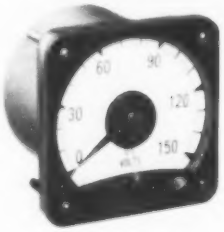
WATTMETERS: 25-125 cycle; Accuracy—±1%; Scale Length and Dimensions same as single instruments; Operating Principle—Electro-dynamometer; Single Phase and Poly-phase types.

VARMETERS: 3-phase, 3-wire; 2-phase, 3-wire; 2-phase, 4-wire; 3-phase, 4-wire; 5 amps; 120-208 v.; 25 cycles to all commercial frequencies; Accuracy—±1%; Operating Principle—Electrodynamometer with autotransformer.

FREQUENCY METERS: 120 v.; 60 cycles; Accuracy—22.5-27.5 c—0.08 c, 45-55 c—0.15 c, 55-65 c—0.15 c, 40-65 c—0.25, 20-90 c—1.00 c, 350-450 c—1.50 c; Operating Principle—Resonant circuit.

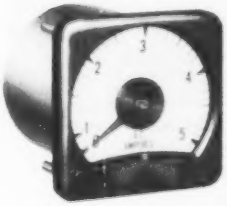
POWER FACTOR METERS: 3-wire, 3-phase, 25-125 cycles; 4-wire, 3-phase, 25-125 cycles; 5 amps; 120-600 v.; Accuracy—±.01 power factor for rated current, voltage and frequency; Operating Principle—Polarized vane.

SYNCHROSCOPES: 25 cycles with external impedor; 50 and 60 cycles, self-contained; 120 v.; 360° rotation; Operating Principle—Polarized vane.



AMMETER and VOLTMETER for semi-flush mounting

Type DB-15 Voltmeter



SCALE LENGTH . . . 7.1 in.

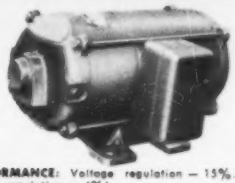
DIMENSIONS
Semiflush Mounting
4¼" x 4¼"

Type AB-15 Ammeter

ACCESSORIES: Various accessories have been designed to widen the scope of measurement of these switchboard instruments. They are adaptable to all types mentioned and include the following:

- External Shunts for D.C. Ammeters
- Standard Shunt Leads
- Long Shunt Leads
- Transfer Switches

WRITE G-E APPARATUS DEPT., SCHENECTADY, N. Y. for complete details or Bulletins



420 CYCLE MOTOR-GENERATOR SET — TWO UNIT — TWO BEARING

60-CYCLE DRIVE MOTOR — OPEN DRIPPROOF — CONTINUOUS DUTY — 40 C RISE

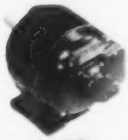
Ball Bearing—Overbolt Construction—Separately Excited (230 Volt) Generator—Induction Drive Motor

Rating — Output					Rating — Input Drive Motor			Model No.	Field Amp.	Field Rheostat Recommended
Kva	Rpm	Volts	Freq.	Phase	Volts	Freq.	Phase			
2	3600	128	420	3	208-220/440	60	3	5ATB75PA1	1.5	80 ohms

PERFORMANCE: Voltage regulation — 15%. (Frequency regulation — 4%).

FIELD RHEOSTAT: CR8000 6-inch single plate is recommended. Order separately from Ind. Control Div., Schenectady.

High-frequency Motor Alternators: Highly recommended for testing equipment and source of power supply for high-frequency machines. Small and lightweight units, but sturdy and hard-working.



FRACTIONAL H P MOTORS

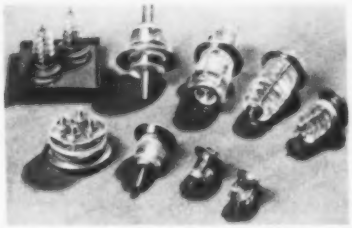
General-purpose Capacitor-start Motors. Used for a multiplicity of general applications. Operate at 1725 rpm on 60 cycle, single-phase power. Open (drippproof) construction with sleeve bearings and solid welded-on base.

HP	Volts	Model
1/6	115	KC43AB280
1/4	115	KC45AB1400
1/3	115/230	KC47AB899
1/2	115/230	KC63AB666
3/4	115/230	KC65AB559

Polyphase motors for Machine-tool and Other Industrial Applications. Operate at 1725 rpm on 60 cycles, 3 phase power. Totally enclosed construction with ball bearings and bolted-on cast-iron base.

HP	Volts	Model
1/4	208-220/440	K43AC2717
1/3	208-220/440	K45AC2000
1/2	208-220/440	K63AC2528
3/4	208-220/440	K65AC179

THYRITE* . . . **A nonlinear resistance material possessing unique electrical property whereby the current varies approximately as a fourth power of the applied voltage. Some of its many applications are: For protective purposes (to limit voltage surges) • As a stabilizing influence on circuits supplied by rectifiers • As a potentiometer (the division of voltage can be made substantially independent of load current) • For the control of voltage-selective circuits, either independent of, or in combination with, electronic devices Write for Bulletin GEA-4138A.**



Write for Bulletin GEA-5093.

CAST GLASS BUSHING

. . . In ratings up to the 15-kv power-transformer impulse level and for currents up to 800 amp permit the successful design of hermetically sealed electric apparatus. Heatproof, leakproof, shockproof bushings for use in vital communication and commercial application where severe operating conditions are continually encountered. Available in a wide variety of sizes and shapes in both single- and multi-conductor designs, they offer the following advantages. 1. Attached directly to apparatus, making gaskets unnecessary and providing a hermetic seal. Designers may utilize all the advantages of present-day insulating materials without fear of reduced dielectric strength caused by the entrance of moisture. 2. Make possible design of more compact, lighter-weight apparatus at lower cost for airborne and other specialized equipment uses. 3. Thermal characteristics of the glass used have been coordinated with those of the metal parts which are directly sealed into the bushing to produce strain-free seals which are capable of withstanding thermal shocks far in excess of operating conditions.

Fig. 1 Type EB-1

Fig. 2 Type EB-2

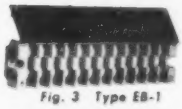


Fig. 3 Type EB-1

Fig. 4 CR5885

TERMINAL BOARDS

. . . Where leads are brought to any part for permanent or temporary connection, especially if many wires are involved, G-E terminal boards provide a neat, compact, and convenient method for attaching the wires. Several types are available to meet the various requirements.

Type EB-1: (Fig. 1) Are 1-piece molded terminal boards with washer-head binding screws for circuit-wire connections. 4, 6, 8, and 12 pole units available. Combinations of these are used to meet specific conditions. Rated 30 amp and 600 v.

Type EB-2: (Fig. 2) Identical in form and construction, except that pressure connectors are furnished for the wire connections. These connectors are simply screwed on the stripped end of the circuit-wire and accommodate 1 No. 8 Awg stranded, 2 No. 12 Awg stranded, or 3 No. 12 Awg solid wires. Rated 30 amp and 600 v.

EB-1 (Fig. 3) with Hinged Cover to prevent collection of dust around connections are recommended when the EB-1 or EB-2 terminal boards are mounted flat. Covers are black Textolite,* available for all sizes of boards. A boss at each end of both EB-1 and EB-2 prevents breakage when mounted on uneven surfaces, and angular construction of base provides increased creepage distance.

CR5885: (Fig. 4) Are sturdy, compact, multipole, 1-piece molded construction, available in 3-, 5-, 7-, and 9-pole units. Staggered arrangement of poles provides more clearance and creepage distance in less space between poles and permits installation where dust conditions are severe. Have clamp-type connectors, and end bosses for mounting on uneven surfaces. Rated 30 amp and 600 v. Write for Bulletin GEA-1497.

*Trade Mark Reg. U. S. Pat. Off.

CALROD* SOLDERING IRONS

Designed for heavy-duty industrial use, G-E Calrod soldering irons combine outstanding construction features with unmatched performance. Ironclad-copper tips and built-in Calrod heaters give fast dependable heat — permit continuous, high-speed soldering—eliminate frequent dressing and reheating. Strong 18-8 stainless steel shells withstand hard use. Simplified disassembly features permit "on-the-spot" maintenance. Write for Bulletin GEA-4519B.

Cat. No.	Watts	Tip Diam. In.
6A161	75	3/16 & 1/32
6A162	100	3/16 & 1/32
6A200	100	1/4
6A201	200	1
6A202	300	1 1/4
6A318	650	1 1/8
6A319	1250	2

OTHER G-E APPARATUS DEPT. PRODUCTS

Amplidyne control	Bulletin GEA-4889
Gear-motors	Bulletin GEA-1437
Generators	Bulletin GEC-289
Strain gages	Bulletin GEA-4226
Test sets	Bulletin GEA-4477
Thermostats	Bulletin GEA-4991
Thickness gages	Bulletin GEC-319
Voltage stabilizers	Bulletin GEA-3634

G-E MIDGET SOLDERING IRON

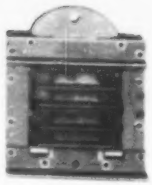
Weighing only 1 3/4 ounces, this 25-watt, 6-volt, 8-in. featherweight iron is ideal for close-quarter soldering with pin-point precision. Designed for use where conventional irons might cause damage . . . be clumsy to handle . . . be more expensive to operate. The Midget literally "goes places" with greater efficiency and less power . . . with no sacrifice in heat or speed. It has chisel-shaped iron-clad copper tips, either 1/8- or 1/4-in. diam., as desired. Specially designed 115/6-volt transformers available as optional equipment.

WRITE G-E APPARATUS DEPT., SCHENECTADY, N. Y. for complete details or Bulletins

A-c or D-c SOLENOIDS—CR9502-9503

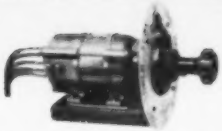
Industrial-type Solenoids CR9503					
Size of Solenoid	Type of Solenoid, 60 and 50 Cycles	Pounds Pull or Push		Wt. of Plunger in Lb	Max Stroke in In.
		At 85% Voltage	At 100% Voltage		
209E	Pull	0.65	0.9	0.12	3/4
209D	Pull	0.9	1.3	.18	1
209C	Pull	3.2	4.5	.31	1
209C	Push	3.2	4.5	.5	1
211E	Pull	10.2	14	.94	1 1/4
211E	Push	10.2	14	1.19	1 1/4
206B	Pull	22.7	30	2.5	1 3/4
206B	Push	22.7	30	3.3	1 3/4
212A	Pull	21.7	30.2	3.3	2
212A	Push	21.7	30.2	4.75	2
213A	Pull	42	57	5.4	2
213A	Push	42	57	7.0	2
214A	Pull	51	73	10	3
214A	Push	51	73	16	3
215A	Pull	70	97	13	3
215A	Push	70	97	19	3

SIMPLIFY COMPLEX INSTALLATIONS. In direct or remote control requiring short powerful thrusts.



WIDE SELECTION: 32 different sizes of uniform construction available for push or pull-type operation and for use on a-c or d-c circuits up to and including 550 volts. To push or pull in straight line, or to provide mechanical motion at a remote or inaccessible location. Complete line of sturdy, industrial-type solenoids for heavy duty applications, available in ratings suitable for almost every application. Operating remotely from push-button station; or, automatically by limit switches, pressure switches, float switches, or other pilot circuit devices. Write for bulletins GEA-5163 (CR9503).

SELSYNS CR9890



Indicating or control selsyns are a reliable, accurate, and rapid means of communication. Used successfully as indicating positions of valves, governors, bridges, turntables, dampers, etc. Very successful in servo systems where the selsyns operate to guide the action of the power units. Two types of selsyns are available—the high-accuracy type which has an accuracy of ± 1 degree and the general-purpose type which has an accuracy of ± 5 degrees. Selection can be made from a variety of sizes suited for each application. Selsyns are also available in a variety of complete indicators and transmitters. Write for Bulletins GEA-2177A and GEA-2176A.

SWITCHETTES—Unit Contact Mechanisms

Size 1 Switchette with terminals projecting from end surfaces. Also available with terminals projecting from top cover.

RATING at 50,000 ft. on 12 and 24 v

a Single-circuit forms or 2-circuit form with electrically separate circuits

Size 1, 10 amp Size 2, 25 amp

b Wire to provide single-pole, single-throw

Size 1, 3.5 amp Size 2, 4 amp

SPECIFICATIONS

	Size 1	Size 2
Weight	0.02 lb	0.125 lb
Plunger travel differential	0.020 in. —0.007 in.	0.040 in.*
Travel to trip	0.037 in. —0.012 in.	

*Approximately same as contact air gap

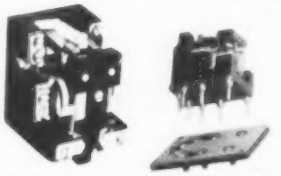
Switchettes CR1070 are used wherever a manually or mechanically operated switch is required, such as: float switch in automatic washing machine; in temperature or pressure limits for domestic oil burners and stokers; in juke boxes, vending machines; and to time industrial processes and operations. A large variety of forms is available to meet any requirements. These midget devices have snap action and double break construction. They are especially applicable where space is limited and long life is desired.

Contact structures available. 1. Single-circuit, normally closed. 2. Single-circuit, normally opened. 3. Two-circuit—one normally open, and one normally closed.

Size 2 Switchette with totally enclosed contact structure. These photos are not exact size.

RELAYS

GENERAL-PURPOSE RELAY CR2790E



RATING: 10 amp—110 or 220 v, a-c; ½ amp at 110 v or 1 hp at 220 v.

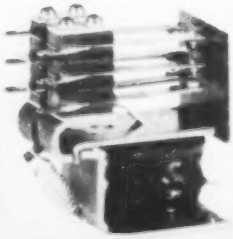
This relay is used to control pilot circuits in response to remote control switch or thermostat, or for direct control of small motors driving pumps, fans, etc. It is also used as a fractional-horsepower motor starter, or in conjunction with a magnetic switch controlling larger motors, heating or lighting circuits, and signal systems. This sturdy, general-purpose relay comes in 7 open or enclosed forms: enclosed in general purpose case; or in explosion-proof and watertight case; open relays may be front-connected or back-connected; or for mounting on a metal base or an insulated base, or with plug-in jacks. 3 contact arrangements are available: double-pole, double-throw; double-pole, single-throw; single-pole, single-throw. Protection against hazard from restarts after power failures can be provided with the double-pole form when one pole is used as a holding interlock in the coil circuit together with a momentary contact push-button station. The relay can be mounted on either insulated or noninsulated bases. The enclosed forms have convenient conduit entrances at both top and bottom. Write for Bulletin GEC-257.

CURRENT-SENSITIVE RELAYS

For electronic applications where switching functions must be performed by small amounts of power, a complete line of current-sensitive, d-c relays is available. Withstand shock and vibration and operate in ambient temperature from —70 F to 200 F. Cover range from 10 mw to 180 mw; 0.47 ma to 1470 ma; 0.07 ohms to 67,000 ohms coil resistance; and weigh from 0.1 to 0.7 lb. Contact ratings from 12 v d-c (a-c) with a contact rating at 24 v (d-c) of 2.0 amp non-inductive and 0.5 amp inductive. Installation easy with plug-in base terminals. Write for Bulletin GEA-3819D.

PUSH BUTTON STATIONS

For control circuits of magnetic controllers designed for push-button control. Standard and heavy-duty stations available which may consist of various combinations of momentary-contact buttons, maintaining contact buttons, selector switches, indicating lights and surface or flush mounting. Standard-duty station recommended for use with contactors rated up to and including 150 amp. Heavy-duty push buttons able to handle higher control currents. Large, double-break contacts and substantial construction of heavy-duty stations withstand frequent operation and rough usage on machine-tool and similar applications. General-purpose, watertight, dusttight, corrosion-resistant and explosion-proof enclosures.



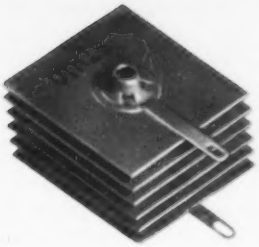
APPLIANCE RELAY CR2790G

Small, inexpensive relay designed for use in vending machines, coin changers, conditioning control and similar equipments using low power—115 v or less—control circuits. Available in many contact arrangements, priced and tooled for high-quantity production to meet growing demand for control relays for automatic appliances. Will handle up to four pole double-throw duty at 3 amp on 115 v a-c. Several forms available for use on a-c or d-c. Write for Bulletin GEA-4864.

WRITE G-E APPARATUS DEPT., SCHENECTADY, N. Y. for complete details or Bulletins

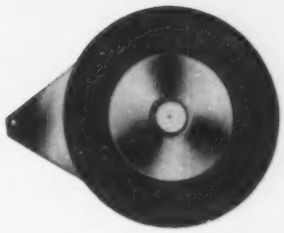
GENERAL ELECTRIC

APPARATUS DEPT.
SCHENECTADY, N. Y.



G-E SELENIUM RECTIFIERS

FOR ELECTRONIC APPLICATIONS



G-E COPPER-OXIDE RECTIFIER

FOR SELF-CHARGING PORTABLES

The General Electric copper-oxide rectifier, Model 6RC8Y3, specially constructed for "self-charging portable radio receivers." Its advantages include: 1. OCCUPIES LESS SPACE. 2. EASY TO INSTALL. 3. COOL OPERATION. 4. LONG LIFE. 5. AMPLE CURRENT CAPACITY. 6. ALL-METAL CONSTRUCTION. For further information, write to Section 640-260, Apparatus Department, General Electric Company, Schenectady, New York.

They "UP" Quality. They "CUT" Costs. They provide dependable performance. They save space. Special construction provides constant and uniform contact pressure on all cells, regardless of temperature variations. A moisture-resistant finish gives protection against humidity, condensation, and dampness.

G-E selenium rectifier stacks are available for use in radio, television, and other electronic circuits requiring 117-volt input with output loads ranging from 80 ma to 350 ma. Thus G-E rectifier stacks may be used in amplifier circuits, voltage doubler circuits, to eliminate tubes, etc. Made by the patented G-E evaporation process, these selenium rectifiers have a long life with minimum aging and a stabilized output.

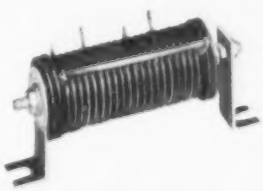
G-E RECTIFIER STACKS

COPPER-OXIDE

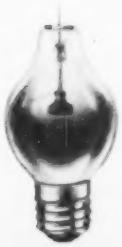
Copper-Oxide Rectifier Stacks offer the following advantages. They . . . Cost less per cell • Stop "aging" after a few months • Are more efficient at high current densities • Will stand short-time voltage (as well as current) overloads. Used for such applications as . . . Circuit breaker operations • Blocking relays in control circuits • Exciter circuits for ignitrons, etc.

SELENIUM

G-E selenium rectifier stacks are made from the highest quality selenium cells. Because of their low forward resistance and low back leakage, G-E selenium rectifiers are recognized as the leader in quality at competitive prices. Used for such applications as . . . Control circuits — Power supplies — Arc suppressors — Testing equipment — Relay and solenoid power supplies — Magnetic amplifiers — Business machines — and many special electronic circuits.



TUNGAR BULBS



Still recognized as a low-cost method of rectification, Tungar* bulbs are reliable, long-lived, and have stable characteristics. They offer a low initial-cost method of obtaining a source of direct current for such applications as . . . Magnetic clutches — Battery chargers — Sound systems — etc.

To fully meet your needs, General Electric makes all three types. If you have a rectifier problem, bring it to us — we play no favorites; we will give you an impartial recommendation.

*Reg. U.S. Pat. Off.

K-TYPE RECTIFIER CELLS FOR ELECTRONIC CIRCUITS

G-E miniature K type cells can be used to replace tubes in many electronic circuits. Their small size make them ideal for many applications where space is a problem. Low forward resistance, low back leakage, and minimum aging assure satisfactory service under normal conditions. Typical applications are: Dual-diode circuits • Voltage-doubler circuits • Blocking. Advantages are: Long life • Stability • Less replacements (under normal conditions expected to outlast tubes) • Uniformity • Saves space • Lower cost (No sockets, minimum installation expense).

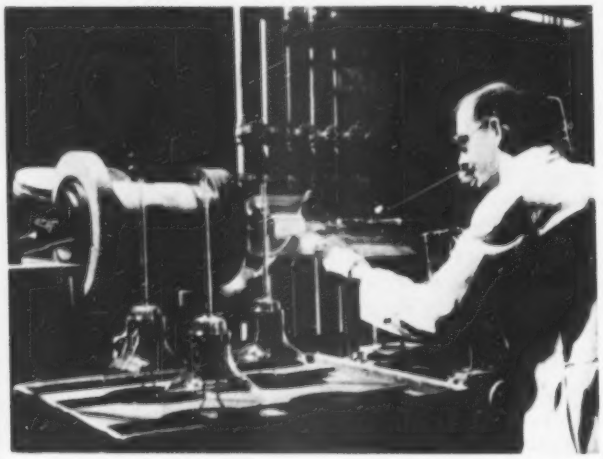
	K-1	K-2	K-3	K-4
MAX. RMS VOLTS	18	18	40	18
MAX. INVERSE PEAK VOLTS	25	25	56.5	25
H.W. MAX. PEAK CURRENT M.A.	.14	3.5	7.0	7.0
H.W. MAX. D.C.M.A.	.10	2.5	5.0	5.0
F.W. MAX. D.C.M.A.	.20	5.0	10.0	10.0

The above cells can be assembled into stacks to meet specific requirements.

WRITE G-E APPARATUS DEPT., SCHENECTADY, N. Y. for complete details or Bulletins

GENERAL ELECTRIC

THERE'S A G-E ELECTRONIC TUBE FOR EVERY PURPOSE



Electronic TUBES

G-E Electronic Tubes are accurately designed to meet the exacting requirements of electronic circuits — whether for communications or industrial use. They are manufactured under rigid material and process controls to assure lasting performance within their ratings. New applications in communications and industrial equipment constantly demand new tube types—GE designs tubes to meet every need.

A Complete Listing of
G-E TRANSMITTING AND INDUSTRIAL TUBES

The following list illustrates the completeness of the G-E Line—
An Electronic Tube for Every Purpose
For complete data send for the G-E Tube Manual shown on the opposite page.

PLIOTRONS

GL-2C39
GL-2C40
GL-2C43
GL-2E24
GL-2E26

GL-2E30
GL-3C22
GL-1000T
GL-4C21
GL-4D21/4-125A

4X150A
GL-5C24
4-250A/5D-22
GL-7C29
GL-7D21

8D-21
GL-9C21
GL-9C22
GL-9C24
GL-35T

GL-100TH
GL-146
GL-152
GL-159
GL-169

GL-203-A
GL-204-A
GL-207
GL-211
GL-242-C

FP-265
FP-285
GL-473
GL-592
GL-800

GL-801-A
GL-802
GL-803
GL-805
GL-806

GL-807
GL-809
GL-810
GL-811-A
GL-812-A

GL-813
GL-814
GL-815
GL-826
GL-828

GL-829-B
GL-830-B
GL-832-A
GL-833-A
GL-835

GL-837
GL-838
GL-842
GL-843
GL-845

GL-849
GL-851
GL-858
GL-862-A
GL-880

GL-889-A
GL-889R-A
GL-891
GL-891-R
GL-892

GL-892-R
GL-893-A
GL-893A-R
GL-895
GL-895-R

GL-898-A
GL-954
GL-955
GL-956
GL-957

GL-959
GL-1000T
GL-1603
GL-1612
GL-1613
GL-1614

GL-1619
GL-1620
GL-1621
GL-1622
GL-1623

GL-1624
GL-1625
GL-1629
GL-1633
GL-1851

GL-5513
GL-5516
GL-5518
GL-5549
GL-5556/PJ-8

GL-5588
GL-5610
GL-5648
GL-5654
GL-5670

GL-5674
GL-5680
GL-5686
GL-5691
GL-5692

GL-5693
GL-5725
GL-5726
GL-5739/FP-62
GL-5740/FP-54

GL-5742/PJ-7
GL-5743/PJ-21
GL-5749
GL-5750
GL-5751

GL-5814
GL-5824
GL-8000
GL-8002
GL-8002-B

GL-8005
GL-8025-A
GL-9001
GL-9002
GL-9003

THYRATRONS

GL-2D21
GL-3C23
FG-27-A
FG-81-A
FG-97

FG-98-A
FG-105
FG-154
FG-172
FG-178-A

GL-393-A
GL-414
GL-502-A
GL-627
GL-672-A

GL-678
GL-884
GL-885
GL-2050
GL-5544

GL-5545
GL-5557/FG-17
GL-5559/FG-57
GL-5560/FG-95
GL-5632

GL-5662
GL-5663
GL-5720/FG-33
GL-5728/FG-67
GL-5830/FG-41

VACUUM CAPACITORS

GL-1L21
GL-1L22
GL-1L23

GL-1L24
GL-1L25

GL-1L31
GL-1L32
GL-1L33

GL-1L36
GL-1L38

Write G-E TUBE DIVISION, SCHENECTADY 5, N. Y. for complete details or Bulletins

GENERAL ELECTRIC

CATHODE RAY TUBES • KENOTRONS • PHOTOTUBES

GL-2AP1-A
GL-2BP1
GL-3AP1-A
GL-3BP1-A
GL-3KP1
GL-3MP1
GL-5BP1-A
GL-5CP1-A
GL-5CP7-A
GL-5FP14
GL-5UP1
GL-7BP1
GL-7BP7-A
GL-12DP7-A
GL-914-A

GL-2B22
GL-2B23
2X2-A
5R4-GY
GL-217-C
GL-218
GL-3B24
FP-400
GL-411
GL-836
GL-1616
GL-1641
GL-5625/KC-4
GL-5741/FP-85-A
GL-8013-A
GL-8020
GL-9004
GL-9005
GL-9006

GL-1P21
GL-1P29/PJ-401
GL-1P37
GL-1P39
GL-1P40
PJ-22
GL-441
GL-868/PJ-23
GL-917
GL-918
GL-919
GL-920
GL-921
GL-922
GL-923
GL-927
GL-929
GL-930
GL-931-A
GL-935
GL-5581

PHANOTRONS • GLOW TUBES • BALLAST TUBES

FG-166
GL-266-B
FG-280
GL-575-A
GL-673
GL-816
GL-867-B
GL-866-A
GL-869-B
GL-870-A
GL-872-A
GL-5558/FG-32
GL-5561/FG-104
GL-8008

GL-OA2
GL-OA3
GL-OB2
GL-OB3
GL-OC3
GL-OD3
GL-874

GL-5620 FB-50
GL-5621 B-6
GL-5622 B-25
GL-5623 B-47
GL-5624 B-46

VACUUM SWITCHES • PHASITRONS • VACUUM GAGES

GL-1521
GL-5626/FA-15
GL-5627/FA-6

GL-2H21
GL-5593

GL-5628/FA-13
GL-5629/FA-14

IGNITRONS

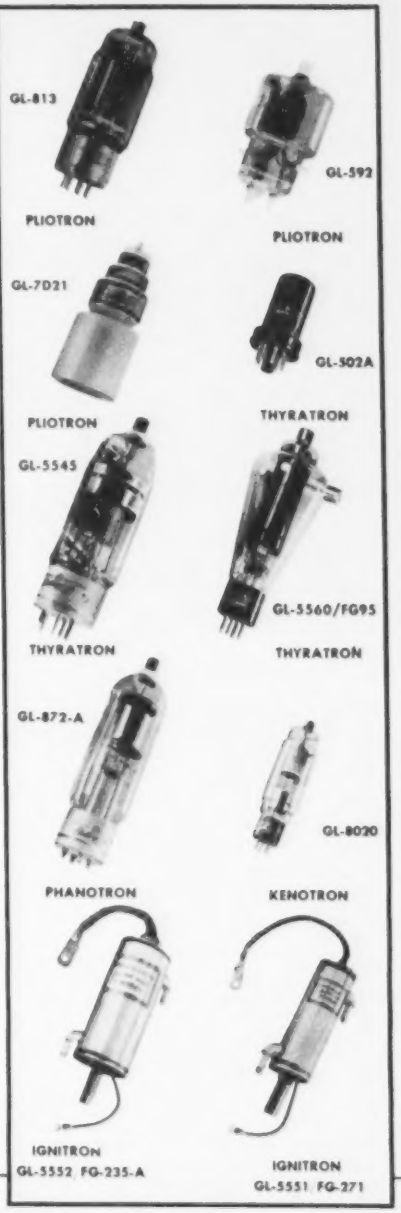
GL-5550/GL-415
GL-5551/FG-271

GL-5552/FG-235-A
GL-5553/FG-258-A
GL-5822

GL-506
GL-5779
GL-5554/FG-259-B
GL-5555/FG-238-B
GL-5630

Welding Control Types*	MAXIMUM RATINGS			
	Kva Demand	Corresponding Average Anode Current, Amp	Maximum Average Anode Current, Amp	Corresponding Kva Demand
GL-5550/GL-415	300	12.1	22.4	100
GL-5551/FG-271	600	30.2	56.0	200
GL-5552/FG-235-A	1200	75.6	140	400
GL-5553/FG-258-A	2400	192.0	355	800
GL-5822 ○	424	20	70	188

*Ratings are for voltages of 600 volts rms and below. Ignitor requirements for all welding-control types are 200 volts and 30 amperes.
○ For frequency-changer welding control.

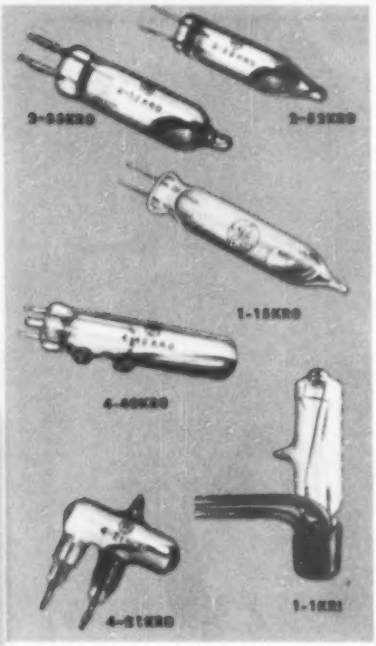


GENERAL ELECTRIC

ELECTRONIC TUBE MANUALS . . .

. . . complete data available on every G-E tube! Designed for and by technical men, the new G-E Electronic Tube Manuals pictured to the left are complete in every detail. They contain comprehensive data on the electrical, mechanical, and performance characteristics of every G-E tube type. Let their easy-to-read graphs and tube outlines help to solve your application problems. For prices and further information write Electronics Department, General Electric Company, Schenectady 5, N. Y.

Write G-E TUBE DIVISION, SCHENECTADY 5, N. Y. for complete details or Bulletins



KON-NEC-TOR MERCURY SWITCHES

Most KON-NEC-TORS are made of heat resisting Pyrex brand glass with current conducted to mercury by tungsten lead-in wires. The small force necessary to tilt a KON-NEC-TOR, wherever available, will cause it to operate positively and silently. Types are also available which are operated by a magnetic field from either a permanent or an electro magnet. Chart on their characteristics is given below and engineering service is available to all users.

GENERAL INFORMATION

Type	Switching Action	Max. Height	Max. Length	Max. Diameter	Lead Length Inches	Holder Clip #	Average Weight in Grams	Internal Resistance in Ohms*	Total Movement Required in degrees
1-1KR1	SPST N. Open						10	25	Magnetically Actuated
1-1KR1	SPST N. Closed						10	25	
1-15KR0	SPST						0.5	0.020	10
2-52KR1	SPST								
2-53KR1	SPST								
2-25KR1	SPST								
2-36KR1	SPDT without neutral								
4-19KR1	SPDT without neutral								
4-21KR1	SPST								
4-24KR1	SPDT								
4-40KR1	SPST								
7-16KR1	SPDT without neutral								
7-21KR1	SPST								
7-24KR1	SPDT with neutral								

The type number ending designates type of lead attached to the Kon Nec Tor. KR1 means standard leads are attached. KR0 means the Kon Nec Tor is furnished without leads.
* Excluding leads.

ELECTRICAL RATINGS

TYPE	VOLTAGE	MAXIMUM CURRENT RATING—AMPERES						MOTOR RATINGS—HORSEPOWER				
		Non Inductive Circuit		Inductive Circuit		Incandescent Lamp Circuit		D.C	A.C 60 Cycles			
		A.C	D.C	A.C	D.C	A.C	D.C		Split Phase	Capacitor	Repulsion Induction	2 and 3 Phase
1-1KR1 1-1KR1	125 250	0.3 0.15	0.15 0.08								1/50 1/50	
1-15KR0	8 125	3 0.100	3 0.100									
2-52KR1	8 125 250	5 2 1	5 1 0.5									
2-53KR1	125 250	3 2	2 1	3 2	* *	1 1	1 1	** **	1/20 1/10		1/12 1/8	** **
2-25KR1 2-36KR1	125 250 550	5 3 1	3 1.5 **	5 3 1	* * **	1 1 1	1 1 **	** ** **	1/12 1/8	1/12 1/8	1/8 1/8	** **
4-21KR1 4-19KR1 4-24KR1 4-40KR1	125 250 550	15 10 8	10 5 **	15 10 8	* * **	10 10 5	10 5 **	1/8 1/8 **	1/8 1/8	1/3 1	3/4 1 1/2	3/4 1 1/2 3
7-21KR1 7-19KR1 7-24KR1	125 250 550	25 20 15	20 10 **	25 20 15	* * **	20 20 15	20 10 **	1/3 1/3 **	1/8 1/8	1 2	1 1/2 3	1 2 5

* No specified rating can be stated. Capacity is lower than on noninductive circuits.
** Not recommended for this service.
† Ratings following this bracket apply to all types listed in the individual group.

MOUNTINGS

Because proper mounting is essential to the satisfactory performance of these KON-NEC-TORS, clips of tempered cadmium plated steel are provided. These are sufficiently flexible to securely hold the somewhat variable diameters characteristic of glass tubes. The use of a drop of adhesive at each clip contact is recommended, to insure the KON-NEC-TOR remaining in the correct mounting plane.

TUBE SOCKETS AND WATER JACKETS

Designed and built for G-E Tubes, they have the same high quality and performance characteristics. Specify them for increased assurance of superior performance and tube life. Available in all popular types.

Write G-E TUBE DIVISION, SCHENECTADY 5, N. Y. for complete details or Bulletins

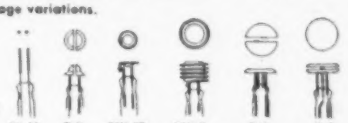
GENERAL ELECTRIC

NEON GLOW LAMPS

The unique characteristics of G-E Neon Glow Lamps recommend them for a variety of uses in radio and electronic devices . . . as indicators, voltage regulators, pilot lights and test lamps. They have • Distinctive orange-red glow — no colored cover glass needed • Dependable performance and long life — rated at 3,000 hr (in excess of 25,000 hr. for NE-2) • Very low current consumption — less than ½ ma for smallest lamp • Variety of sizes and wattages • High resistance to vibration, shock • Produce practically no heat • Nearly flat V-amp characteristics • Lamp life not seriously affected by voltage variations.

ELECTRODE SHAPES

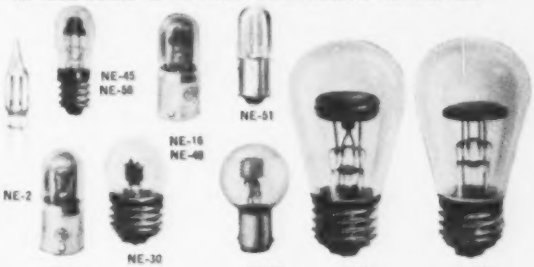
NOTE—Electrodes not to scale



BASE DESIGNATIONS

SCREW BASE LAMPS . . . *Required series resistor mounted within base. See values marked "IN" in column "Series Resistance." Lamps may be applied to higher circuit voltages by use of suitable external resistors.*

BAYONET BASE LAMPS . . . *External means must be provided to limit current to normal amount. External resistors, to be supplied by user, should be of the values marked "EX" in column "Series Resistance" for rated volts.*



CLEAR NEON LAMPS

Lamp Number		NE-2	NE-51	NE-48	NE-16	NE-45	NE-17	NE-57	NE-30	NE-32	NE-56	NE-34	NE-36	NE-40	NE-42	NE-56
Watts, Nominal		1/25	1/25	1/4	1/4	1/4	1/4	1/4	1	1	1	2	2	3	3	1/2
Volts (Circuit)		105-125	105-125	105-125	105-125	105-125	105-125	105-125	105-125	105-125	210-250	105-125	105-125	105-125	105-125	210-250
★Bulb		T-3	T-3¼	T-4½	T-4½	T-4½	T-4½	T-4½	G-10	G-10	G-10	S-14	S-14	S-14	S-14	T-4½
Base		Unbased (Wire Term.)	S. C. Bay. Min.	D. C. Bay. Cand.	D. C. Bay. Cand.	Cand. Screw	D. C. Bay. Cand.	Cand. Screw	Med. Screw	D. C. Bay Cand.	Med. Screw	Med. Screw	Sk. D. C. Bay. Cand.	Med. Screw	Sk. D. C. Bay. Cand.	Cand. Screw
Max. Over-all Length, Inches		1⅛③	1⅛	1½	1½	1⅝	1½	1⅝	2⅛	2⅛	2⅛	3⅛	3⅛	3⅛	3⅛	1⅝
Electrode Shape		W-11	W-11	P-3	P-3	P-3	PW-27	PW-27	PW-8	PW-8	PW-8	P-2	P-2	P-4	P-4	P-3
Approx. Starting Voltage①	A.C.	85	85	85	—	85	85	85	90	90	90	90	90	80	80	85
	D.C.	90	90	90	⑥	90	75①	75①	95	95	95	85	85	85	85	90
Series Resistance	Ohms	200000 EX	200000 EX	30000 EX	30000 EX	30000 IN	30000 EX	30000 IN	4800 IN	4800 EX	33000 IN	3000 IN	3000 EX	2200 IN	2200 EX	100000 IN
Package Quantities	Unit	100	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Standard	1000	100	100	100	100	100	100	100	100	100	100	100	100	100	100
List Price and Tax Symbol		$0.08 T	$0.10 T	$0.35 T	$0.42 N	$0.40 T	$0.45 T	$0.40 T	$0.40 T	$0.45 T	$0.40 T	④$0.50 T	$0.55 T	⑤$0.60 T	$0.65 T	$0.40 T

★ Bulbs are designated by a letter to indicate shape and a figure to indicate the approximate diameter in eighths of an inch.

1. Applies to a new lamp.
2. The 1-1/16" dimension is for glass parts only, the lamp has wire terminals which extend 13/16".
3. Meets JAN-1A specifications for 991. Special marking JCG-991 supplied at small extra charge.
4. Designed for 67-87 volts, D.C. (D.C. operating voltage at 1.5 milliamperes, 53-65 volts.)
5. Center electrode connected to base shell.
6. NE-34 and NE-40 are supplied with red sprayed finish at additional charge of 5¢ each, list.
7. D.C. starting voltage is for lamp connected so that center electrode is negative.

NOTE — T — Following List Price indicates subject to Federal Tax. N — Nontaxable.

RADIO DIAL LAMPS

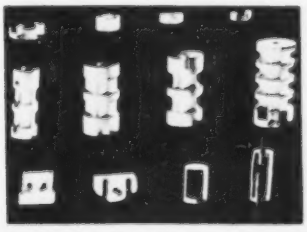
Because of the vibration conditions under which G-E radio dial lights must operate, particular care is given to their design and manufacture. Low voltage filaments are designed to vibrate without damage and are secured by a shake-proof joint. They feature . . . Dependable, trouble-free performance • High level of maintained light output • Low current consumption • Long life.

Lamp Number	40	41	42	43	44	45	46	47	48	49	1490	1BC7	2BC7/BC
Volts	6-8	2.5	3.2	2.5	6-8	3.2	6-8	6-8	2	2	3.2	110-55	110-55
Amps	0.15	0.50	0.35	0.50	0.25	0.35	0.25	0.15	0.00	0.00	0.15	10 watts	10 watts
#Bulb	T-3¼	T-3¼	T-3¼	T-3¼	T-3¼	T-3¼	T-3¼	T-3¼	T-3¼	T-3¼	T-3¼	C-7	C-7
Base	Min. Screw	Min. Screw	Min. Screw	Min. Bay.	Min. Bay.	Min. Bay.	Min. Screw	Min. Bay.	Min. Screw	Min. Bay.	Min. Bay.	Cand. Screw	D.C. Bay.
Bead Color	Brown	White		White	Blue		Blue	Brown	Pink			—	—
Price	$0.10T	$0.10T	$0.12T	$0.10T	$0.10T	$0.12T	$0.10T	$0.10T	$0.15T	$0.15T	$0.11T	$0.15T	$0.22T

Bulbs are designated by a letter to indicate shape and a figure to indicate the approximate diameter in eighths of an inch.

T After price indicates Federal Excise Tax will be billed as a separate item at 6.3% of list price.

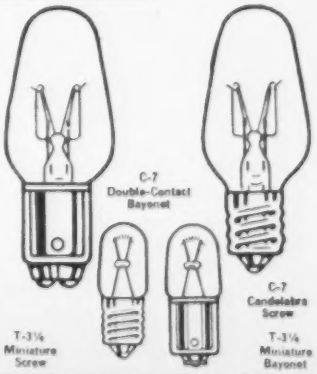
FUSED QUARTZ INSULATORS FOR CRITICAL ELECTRONIC WORK



Fused quartz, both clear and translucent, is manufactured by the General Electric Company in rod, tubing and ingot form. This material can also be fabricated into functional shapes to meet most individual requirements. For engineering service on your specific problem, write the G-E Lamp Dept.

Only Fused Quartz Has ALL These Characteristics • *stands high temperature* • *high resistance to thermal shock* • *low power loss* • *low surface leakage* • *high dielectric strength* • *non hydroscopic* • *stands high current flashovers without failure* • *high crushing strength . . .*

can be machined to accurate tolerances.



Write G-E LAMP DEPARTMENT, NELA PARK, CLEVELAND 12, OHIO, for complete details or Bulletins

GENERAL ELECTRIC

GENERAL ELECTRIC SALES OFFICES

APPARATUS DEPARTMENT
Schenectady 5, N. Y.

Akron 8, Ohio	335 S. Main St.
Albany 7, N. Y.	90 State St.
Albuquerque, N. M.	323 S. Third St.
Allentown, Pa.	1014 Hamilton St.
Amarillo, Tex.	300 Polk St.
Atlanta 3, Ga.	187 Spring St., N. W.
Bakersfield, Calif.	211 E. 18th St.
Baltimore 1, Md.	111 Park Ave.
Bangor, Me.	77 Central St.
Beaumont, Tex.	398 Pearl St.
Binghamton, N. Y.	19 Chenango St.
Birmingham 3, Ala.	1804—7th Ave., N.
Bluefield, W. Va.	Appalachian Bldg.
Boston 1, Mass.	140 Federal St.
Buffalo 3, N. Y.	535 Washington St.
Butte, Mont.	103 N. Wyoming St.
Canton 2, Ohio	700 Tuscarawas St., W.
Cedar Rapids, Iowa	203 Second St., S. E.
Charleston 28, W. Va.	306 MacCorkle Ave., S. E.
Charlotte 1, N. C.	200 S. Tryon St.
Charlottesville, Va.	123 E. Main St.
Chattanooga 2, Tenn.	832 Georgia Ave.
Chicago 80, Ill.	840 S. Canal St.
Cincinnati 2, Ohio	215 W. Third St.
Cleveland 4, Ohio	4966 Woodland Ave.
Columbia 1, S. C.	1420 Lady St.
Columbus 15, Ohio	40 S. Third St.
Corpus Christi, Tex.	108½ N. Chaparral St.
Dallas 2, Tex.	1801 N. Lamar St.
Davenport, Iowa	511 Pershing Ave.
Dayton 2, Ohio	118 W. First St.
Denver 2, Colo.	650 Seventeenth St.
Des Moines 9, Iowa	418 W. Sixth St.
Detroit 2, Mich.	700 Antoinette St.
Duluth 2, Minn.	14 W. Superior St.
Elmira, N. Y.	Main and Woodlawn Aves.
El Paso, Tex.	109 N. Oregon St.
Erie 2, Pa.	10 E. Twelfth St.
Eugene, Ore.	29 W. Eleventh St.
Evansville 19, Ind.	123 N. W. Fourth St.
Fairmont, W. Va.	511 Jacobs Bldg.
Fargo, N. Dak.	102 W. Lincoln St.
Fort Wayne 2, Ind.	127 W. Berry St.
Fort Worth 2, Tex.	408 W. Seventh St.
Fresno 1, Calif.	407 Patterson Bldg.
Grand Rapids 2, Mich.	148 Monroe Ave., N. W.
Greensboro, N. C.	301 S. Elm St.
Greenville, S. C.	108 W. Washington St.
Hagerstown, Md.	Professional Arts Bldg.
Harrisburg, Pa.	229 N. Second St.
Hartford 3, Conn.	410 Asylum St.
Houston 1, Tex.	1312 Live Oak St.
Indianapolis 4, Ind.	110 N. Illinois St.
Jackson, Mich.	120 W. Michigan Ave.
Jackson 1, Miss.	203 W. Capitol St.
Jacksonville 2, Fla.	700 E. Union St.
Jamestown, N. Y.	2 Second St.
Johnson City, Tenn.	334 E. Main St.
Johnstown, Pa.	841 Oak St.
Kansas City 6, Mo.	106 W. Fourteenth St.
Knoxville 08, Tenn.	602 S. Gay St.
Lansing 68, Mich.	215 S. Grand Ave.
Lincoln 8, Nebr.	1001 "O" St.
Little Rock, Ark.	103 W. Capitol Ave.
Los Angeles 54, Calif.	212 N. Vignes St.
Louisville 2, Ky.	455 S. Fourth St.
Madison 3, Wis.	16 N. Carroll St.
Manchester, N. H.	875 Elm St.
Medford, Ore.	205 W. Main St.
Memphis 3, Tenn.	8 N. Third St.
Miami 32, Fla.	25 S. E. Second Ave.
Milwaukee 3, Wis.	940 W. St. Paul Ave.
Minneapolis 2, Minn.	12 S. Sixth St.
Mobile 13, Ala.	54 St. Joseph St.
Nashville 3, Tenn.	234 Third Ave., N.
Newark 2, N. J.	744 Broad St.
New Haven 6, Conn.	129 Church St.
New Orleans 12, La.	837 Gravier St.
New York 22, N. Y.	570 Lexington Ave.
Niagara Falls, N. Y.	253 Second St.
Norfolk 10, Va.	229 W. Buta St.
Oakland 12, Calif.	409 Thirteenth St.
Oklahoma City 2, Okla.	119 N. Robinson St.
Omaha 2, Nebr.	409 S. 17th St.
Pasco, Wash.	421 W. Clark St.
Peoria 2, Ill.	410 Main St.
Philadelphia 2, Pa.	1405 Locust St.
Phoenix, Ariz.	303 Luhrs Tower
Pittsburg, Kan.	508 W. Euclid Ave.
Pittsburgh 22, Pa.	535 Smithfield St.
Portland 3, Me.	477 Congress St.
Portland 7, Ore.	920 S. W. Sixth Ave.
Providence 3, R. I.	Industrial Trust Bldg.
Raleigh, N. C.	336 Fayetteville St.
Reading, Pa.	31 N. Sixth St.
Richmond 17, Va.	700 E. Franklin St.
Riverside, Calif.	3808 Main St.
Roanoke 11, Va.	101 S. Jefferson St.
Rochester 4, N. Y.	89 East Ave.
Rockford, Ill.	110 S. First St.
Rutland, Vt.	38½ Center St.
Sacramento 14, Calif.	626 Forum Bldg.
Saginaw, Mich.	128 N. Franklin St.
St. Louis 2, Mo.	112 N. Fourth St.
Salt Lake City 9, Utah	200 S. Main St.
San Antonio 5, Tex.	310 S. St. Mary's St.
San Diego 1, Calif.	861 Sixth Ave.
San Francisco 6, Calif.	235 Montgomery St.
San Jose 16, Calif.	409 Bank of America Bldg.
Savannah, Ga.	4 E. Bryan St.
Seattle 4, Wash.	710 Second Ave.
Shreveport 90, La.	803 Jordan St.
Sioux City 13, Iowa	507 Sixth St.
Sioux Falls, S. D.	321½ S. Phillips Ave.
South Bend 1, Ind.	112 W. Jefferson Blvd.
Spokane 8, Wash.	South 162 Post St.
Springfield, Ill.	607 E. Adams St.
Springfield 3, Mass.	1387 Main St.
Stockton, Calif.	11 S. San Joaquin St.
Syracuse 2, N. Y.	113 S. Salina St.
Tacoma 1, Wash.	1019 Pacific Ave.
Tampa 6, Fla.	1206 North "A" St.
Toledo 4, Ohio	420 Madison Ave.
Trenton, N. J.	214 E. Hanover St.
Tulsa 3, Okla.	320 S. Boston Ave.
Utica 2, N. Y.	258 Genesee St.
Washington 5, D. C.	806 15th St., N. W.
Waterbury 89, Conn.	111 W. Main St.
Waterloo, Iowa	206 W. Fourth St.
Wheeling, W. Va.	40 14th St.
Wichita 2, Kan.	200 E. First St.
Williamston, N. C.	City Hall
Wilmington, Del.	1326 N. Market St.
Worcester 8, Mass.	507 Main St.
York, Pa.	56 N. Harrison St.
Youngstown 5, Ohio	272 E. Indianola Ave.
For Alaska	Seattle, Wash. Office
For Hawaii	W. A. Ramsay, Ltd., Honolulu, T. H.

LAMP DEPARTMENT
Nela Park, Cleveland 12, Ohio

Albany 7, N. Y.	8 Elk St.
Atlanta 3, Ga.	187 Spring St., N. W.
Baltimore 1, Md.	101 No. Charles St.
Boston 10, Mass.	50 High St.
Buffalo 2, N. Y.	1 W. Genesee St.
Charlotte 2, N. C.	516 Johnston Bldg.
Chicago 4, Ill.	231 So. LaSalle St.
Chicago 4, Ill.	230 So. Clark St.
Cincinnati 2, Ohio	36 E. Fourth St.
Cleveland 14, Ohio	1320 Willlamson Bldg.
Dallas 2, Tex.	1801 N. Lamar St.
Davenport, Iowa	301 Davenport Bank Bldg.
Denver 2, Colo.	1863 Wazee St.
Detroit 26, Mich.	1249 Washington Blvd.
Detroit 2, Mich.	280 Fisher Bldg.
Houston 2, Tex.	1811 National Standard Bldg.
Indianapolis 4, Ind.	1115 Circle Tower
No. Kansas City 16, Mo.	200 E. 16th Ave.
Los Angeles 13, Calif.	601 W. Fifth St.
Memphis 7, Tenn.	1179 Morehead St.
Milwaukee 3, Wis.	161 W. Wisconsin Ave.
Minneapolis 13, Minn.	500 Stinson Blvd.
Newark 2, N. J.	744 Broad St.
New Haven 10, Conn.	185 Church St.
New York 22, N. Y.	570 Lexington Ave.
Philadelphia 2, Pa.	1405 Locust St.
Pittsburgh 19, Pa.	238 W. Carson St.
Portland 9, Ore.	1238 N. W. Glisan St.
Richmond 19, Va.	627 E. Main St.
San Francisco (Oakland 7, Calif.)	1614 Campbell St.
St. Louis 1, Mo.	710 No. Twelfth Blvd.
Seattle 4, Wash.	202 Hoge Bldg.
Tampa 2, Fla.	409 E. Cass St.

CHEMICAL DEPARTMENT
Pittsfield, Mass.

Bloomfield, N. J.	5 Lawrence St.
Boston 1, Mass.	140 Federal St.
Chicago 80, Ill.	840 S. Canal St.
Cincinnati 2, Ohio	215 W. Third St.
Cleveland 14, Ohio	1105 Chester Ave.
Coshocton, Ohio	Coshocton, Ohio
Dayton 2, Ohio	601 E. Third St.
Detroit 14, Mich.	9101 E. Jefferson Ave.
Los Angeles 15, Calif.	1233 S. Hope St.
Meriden, Conn.	69 Colony St.
New York 22, N. Y.	570 Lexington Ave.
Philadelphia 2, Pa.	1405 Locust St.
Pittsburgh 6, Pa.	6519 Penn Ave.
Pittsfield, Mass.	1 Plastics Ave.
Schenectady 5, N. Y.	1 River Rd.
Syracuse 2, N. Y.	113 S. Salina St.
Waterford, N. Y.	Mechanicville Rd.

TUBE DIVISION
Schenectady 5, N. Y.

Atlanta 3, Ga.	187 Spring St., N. W.
Boston 1, Mass.	140 Federal St.
Chicago 54, Ill.	The Merchandise Mart, Room 1122
Cincinnati 2, Ohio	215 W. Third St.
Cleveland 4, Ohio	710 Williamson Bldg., Euclid Ave. & Public Square
Dallas 2, Texas	Nerman Bldg., Ross & Lamar Sts.
Denver 2, Colo.	650 17th St.
Detroit 26, Mich.	3037 Book Tower
Houston, Texas	812 Electric Bldg.
Kansas City 6, Mo.	106 W. 14th St.
Los Angeles 14, Calif.	Suite 1300 Security Title Ins. Bldg., 530 W. 6th St.
Minneapolis, Minn.	12 S. Sixth St.
New York 22, N. Y.	570 Lexington Ave.
Philadelphia 2, Pa.	1405 Locust St.
Salt Lake City, Utah	200 S. Main St.
San Francisco 6, Calif.	235 Montgomery St.
Seattle 11, Wash.	710 2nd Ave.
Washington 5, D. C.	806 15th St., N. W.

ELECTRONICS DEPARTMENT
Electronics Park, Syracuse, N. Y.

Atlanta 3, Ga.	187 Spring St., N. W.
Boston 1, Mass.	140 Federal St.
Chicago 54, Ill.	The Merchandise Mart, Room 1122
Cleveland 14, Ohio	710 Williamson Bldg., Euclid Ave. & Public Square
Dallas 2, Texas	Nerman Bldg.
Kansas City 6, Mo.	106 W. 14th St.
New York 22, N. Y.	570 Lexington Ave.
Philadelphia 2, Pa.	1405 Locust St.
San Francisco 6, Calif.	235 Montgomery St.

CONSTRUCTION MATERIALS
Bridgeport 8, Conn., 1285 Boston Ave.

Boston 10, Mass.	136 Federal St.
Charlotte, N. C.	1300 Berryhill
Chicago 80, Ill.	840 South Canal St.
Cleveland 14, Ohio	925 Euclid Ave.
Houston 20, Texas	11 Japhet St.
Kansas City 6, Mo.	106 W. 14th St.
Los Angeles 58, Calif.	3000 E. 46th St.
New York 22, N. Y.	570 Lexington Ave.
Philadelphia 2, Pa.	1405 Locust St.
St. Louis 8, Mo.	3928 Lindell Blvd.
Seattle 11, Wash.	710 Second Ave.

SHURE *NEW* AND COMPLETE SHURE LINE OF OUTSTANDING MICROPHONES AND PICKUPS

SHURE SUPER-CARDIOID DYNAMIC MICROPHONES

The new Shure Super-Cardioid Dynamic Microphones are Multi-Impedance Microphones—giving you three microphones in one. Reduces your inventory, increases your sales through rapid turn-over. Model "556" is specially designed for Broadcasting. Held within extremely close tolerances in frequency response. Features internally isolated cartridge and external vibration absorbing unit. Model "55" is a "General Purpose," high-quality dynamic. It has the same mechanical properties as "556" with the exception of the external vibration absorbing unit.

Following is technical data covering both models:

Reduces reflections and reverberation—decreases random noise pickup by 73%. Smooth response from 40 to 15,000 cycles over wide angle at front—dead at rear. Single unit construction accomplished through Shure "Uniphase" principle (Patented). Floating moving coil system. Swivel head. Standard ⅝"—27" thread. Convenient terminals for attaching longer length cables. Case 4¼" high, 3¼" wide, 3⅛" deep.

"556" SUPER-CARDIOID (For Broadcast)

MODEL	CABLE	SHPG. WEIGHT	CODE	LIST PRICE
556	7 ft.	3½ lbs.	RUMUB	$92.50
55	25 ft.	4 lbs.	RUMUL	$67.50

Multi-Impedance Switch on Models "55" and "556"

IMPEDANCE TABLE	OUTPUT LEVEL
L—35-50 ohms	56.1 db below 1 Milliwatt per 10 bar signal
M—150-250 ohms	56.8 db below 1 Milliwatt for 10 bar signal
H—High	57.5 db below 1 volt per bar

"UNIDYNE" SUPER-CARDIOID DYNAMIC (For General Purpose)

MODEL "51" SONODYNE

"SONODYNE"
MULTI-IMPEDANCE DYNAMIC

Features a Multi-Impedance switch for Low, Medium, or High Impedance. High-output of 53 db below 1 volt per dyne per sq. cm. Wide-range frequency response (60-10,000 c. p. s.) and semi-directional pickup. Moving coil unit. Satin-Chrome case. Ideal for general purpose use. Shipping weight 3½ lbs. 20 ft. cable.

Model "51" Code: RUSON List Price: $39.75

"MONOPLEX"
SUPER-CARDIOID CRYSTAL

Same phase-shifting network as used in Shure "Broadcast" microphones. Reduces feedback 73%! Ideal for high quality public address, recording, etc. Frequency response 60 to 10,000 c. p. s. Output level −53 db. Special metal-seal crystal for long life in humid areas. Built-in cable connector. Satin chrome finish. Shipping weight 2¼ lbs. Supplied with 20' cable.

Model "737A" Code: RUMON List Price: $39.75

MODEL "737A" MONOPLEX

MODEL "520" GREEN BULLET

"GREEN BULLET"
CONTROLLED RELUCTANCE

This new magnetic microphone is designed to provide quality music and speech reproduction at moderate cost. Features high sensitivity, impedance flexibility without a transformer. Output level −62 db, frequency response 100 to 7,000 cycles. Immune to high temperatures and humidity. Available in high impedance. Special green metallic finish. Cable length 15'. Shipping weight 1½ pounds.

Model "520" Code: RUDAL List Price: $16.50

"HERCULES"
CONTROLLED RELUCTANCE MICROPHONE

A rugged hand-held magnetic unit. Provides the clear reproduction and high output long needed for public address, communications and recording at an amazingly low price! Ideal for general-purpose use in humid areas. High impedance obtained without the use of a transformer. Frequency response 100 to 7,000 c.p.s. Furnished with 7' fabric covered cable.

Model "510" Code: RUTUF List Price: $12.95
Model "510S" (With Switch) Code: RUTUS List Price: $14.95

Also available as a low-cost crystal microphone, the new Shure "Rex". See catalog 159.

"510" SERIES HERCULES

SHURE "VERTICAL DRIVE" CRYSTAL PHONOGRAPH PICKUPS

The Shure "Vertical Drive" Crystal Pickups are ideal for the reproduction of the new fine-groove vinylite and high quality standard groove recordings (33⅓ RPM, 45 RPM, Standard 78 RPM records). They provide the high needle compliance and the maximum fidelity needed to reproduce the full frequency range of the better records. The "Vertical Drive" also features high output, low tracking force, and finger-tip needle replacement. The 901D "All-Purpose" Pickup is provided with .0027" Osmium and .001" Sapphire point "Muted Stylus" needles. The high needle compliance of the Model 901D eliminates the need for shifting of weight or needle force when playing both fine-groove and standard records with one cartridge, such as required with most other turn-over pickups.

MODEL	OUTPUT at 1000 CPS.	RESPONSE TO	NEEDLE SCREW	SHIP. WT.	CODE	LIST PRICE
901D	(MG) 1.0 (STD) 1.1	6,000 CPS	KNURLED NUT	12 oz.	RUZEL	$16.25
901MG	1.0	10,000 CPS	KNURLED NUT	12 oz.	RUZUG	12.75

SHURE REPLACEMENT CARTRIDGES—"9-OUT-OF-10" PACK

Below is technical data on three Shure lever type cartridges—the standardized replacement line that will handle nine out of ten Crystal Cartridge replacements. A copy of the Shure Replacement Chart is in each carton. These cartridges feature low needle force, high needle compliance, crystal shock immunity, pin-tip terminals. These cartridges are not merely adequate replacements—they are acoustic advancements. MODEL: W50B CODE: RUPAL LIST PRICE $18.50

MODEL	REPLACES SHURE	REPLACES	MIN. NEEDLE-FORCE	OUTPUT VOLTAGE	SHIP. WT.	CODE	LIST PRICE
W57A	P87, P90D, P93S, P94, P94B	Any Standard Flat-Type Cartridge of Equal Output	¼ oz.	1.6	⅝ oz.	RUGLA	$6.55
W58A	P87S, P90S, P92B, P93S, W42A		1 oz.	1.6	⅝ oz.	RUGLU	5.55
*W60B	P30 Series, W57AN		1 oz.	1.6	⅝ oz.	RUSHD	7.50

*With Osmium Point Needle

"TROPI-PAC"—
FOR HUMID OR ARID REGIONS

The new Shure "Tropi-Pac" is a crystal cartridge replacement package for Southern States and humid areas in sub-tropical countries. Contains W58HS and W60HS "Humi-Seal" Rochelle Salt crystal cartridges that last longer and operate with greater efficiency than any other Rochelle Salt crystal cartridges of comparable output. The crystals in both cartridges are encased in a special plastic and metal wrap—for long life. These cartridges are Rochelle Salt Crystal Cartridges—do not confuse with PN-type cartridges. No circuit compensation is necessary! Model "W50T" Code: RUPAT List Price: $15.00

Shure Microphones and Pickups Manufactured Under Shure Patents Issued and Pending—Crystal Products Licensed Under Patents of the Brush Development Co.

SHURE

SHURE BROTHERS, INC.

Microphones & Acoustic Devices

225 W. HURON ST., CHICAGO 10, ILL. U. S. A. • CABLE ADDRESS: SHUREMICRO

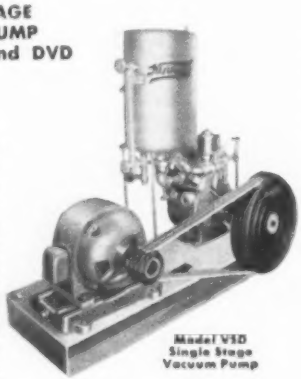
Kinney High Vacuum Pumps

Mechanical, Oil Sealed

Almost without exception in the United States and in an increasing number of plants abroad, Kinney High Vacuum Pumps are standard equipment for exhausting lamps and tubes. They also provide low absolute pressures for sintering alloy metals, coating lenses, refining rare metals and producing blood plasma, penicillin, and other drugs. They are used effectively wherever a dry vacuum pump can be applied, including cyclotron evacuation and atom smashing. Kinney Vacuum Pumps have been perfected with the engineering experience gained from many thousands of installations.

Description. The mechanism consists of three moving parts: (1) the shaft on which is keyed an eccentric, (2) the rotating plunger with hollow arm which moves freely in (3) the slide pin. There is one set of all these parts in the Simplex Model VSD Pump, and one shaft with two sets of parts operating in parallel in the Duplex Model DVD Pumps, with cams set 180° apart. The Compound Model CVD Pump has two plungers in series, connected to an oil chamber between stages. The unique method of automatic lubrication results in a no-clearance pump of extremely long life since plungers have no contact with cylinder surfaces. Simple and efficient in design, these pumps have established an impressive record for dependability and low cost operation.

SINGLE STAGE VACUUM PUMP Models VSD and DVD



Model VSD Single Stage Vacuum Pump

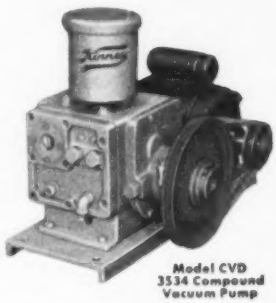
Eight pump sizes cover a capacity range from 13 to 702 cu. ft. per min. with motors from ½ to 40 h.p., respectively. The three smallest sizes are furnished water cooled or air cooled; all larger sizes are furnished water cooled. Single Stage Pumps on a blank test produce low absolute pressures of 10 microns (.01 mm Hg.) or better.

COMPOUND VACUUM PUMP, Model CVD

Three sizes of Compound Pumps are available in capacities of 4.9, 15.2 and 46 cu. ft. per min., respectively. The working mechanism is similar to the Single Stage but the two cylinders are connected in series. The Compound Pump has an air cooled casing of unique design and special provision for oil sealing and lubricating the high vacuum working parts. Compound pumps test to low absolute pressures of 0.5 micron (.0005 mm Hg.) or better.

Model CVD 8610 Compound Vacuum Pump

The latest addition to the line of Kinney Compound Pumps is the Model CVD 3534 shown at right. This new pump is small and compact — less than 16" high. It has a free air displacement of 4.9 cu. ft. per min. and operates with ⅓ h.p. motor. Simple, rugged construction assures utmost reliability in the consistent production of high vacuum.



Model CVD 3534 Compound Vacuum Pump

KINNEY VACUUM TIGHT VALVES

Kinney Vacuum Tight Valves greatly facilitate testing installations at low absolute pressures. In these valves, special metal bellows are used to eliminate the leakage at the valve stem which occurs with the usual stuffing box. Two types of valves are available — cast steel or bronze. Cast steel valves utilize stainless steel Vacu-Lastic bellows having a wide flexing range. They are available in sizes 1", 1½", 2", 3", and 4" — bronze valves 1", 1½", 2", and 3". Write for Bulletin 2448.

Ask for Kinney High Vacuum Pump Bulletin V45.

KINNEY MANUFACTURING COMPANY

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PRODUCTS: Vacuum Pumps, Rotary Liquid Pumps, Bituminous Distributors

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Finest Cored Solder in the World

ERSIN Multicore

The only 3 core solder made with ERSIN FLUX...the original non-corrosive, extra-active flux

TECHNICAL ADVANTAGES

Multicore Solder

- Three separate cores of flux eliminate possibility of no flux in a portion of the wire, which may occur in single cored solder. Guaranteed continuity of the flux stream prevents "dry" joints, i.e. those having high electrical resistance.
- Although there are three cores of flux in Multicore, the total percentage of flux to solder is no greater than in single cored solder.
- Very rapid melting results from the multiple core construction which provides thinner walls of solder than are found in same gauge single cored solder.
- Multicore's unique properties make perfect joints possible on difficult metals and alloys, even if oxidized.
- Ability to tin rapidly produces perfect joints with less solder. Greater coverage per pound.

Ersin Flux

- Ersin Flux is an exclusive product of Multicore Solders Limited, and is only supplied as part of Multicore Solder. It is a high grade, water white rosin, homogeneously activated.
- Confers on rosin a vigorous fluxing action without affecting the non-corrosive and protected features of the original rosin.
- Soldered joints made with Ersin Flux do not corrode even after prolonged exposure to a degree of humidity.
- Reduces the surface tension of molten solder, causing it to wet metals rapidly, increasing speed of operation with resultant production economies.
- Free from objectionable odor. Non-toxic in use.
- Leaves nothing but pure rosin on the work after soldering, and may be used wherever plain rosin is specified.

ALLOY AND MELTING POINTS OF ERSIN MULTICORE SOLDER

Alloy Tin/Lead	Multicore Color Code	Solidus °C.	Liquidus °C.	Recommended bit temperature °C.	USES
60/40	Red	183°	190°	230°	High quality work requiring low melting point alloy.
50/50	Yellow	183°	212°	252°	Hand soldering. Radio, telephone and electrical equipment, batteries.
45/55	Crimson/Buff	183°	227°	267°	
40/60	Green	183°	238°	278°	
30/70	White	183°	257°	297°	Fuses, motors, dynamos.
20/80	Purple	183°	276°	316°	Lamps, motors, dynamos.

STANDARD GAUGES

Standard Wire Gauge	Diameter in Inches	Diameter in Millimeters	Approximate Number of Feet per lb. ALLOY					
			60/40	50/50	45/55	40/60	30/70	20/80
10	1.128	3.251	25.2	24.1	23.5	23.0	21.9	20.8
12	0.104	2.642	38.1	36.5	35.2	34.9	33.1	31.5
13	0.092	2.337	48.7	46.6	45.3	44.5	42.3	40.3
14	0.080	2.032	64.4	61.7	59.2	58.6	56.0	53.3
16	0.064	1.626	100.5	96.4	94.3	92.1	87.5	83.3
18	0.048	1.219	178.5	171.0	167.8	163.5	155.5	148.0
19	0.040	1.016	257.5	246.5	240.4	235.5	224.0	213.0
20	0.036	0.914	318.0	304.5	302.5	291.0	276.5	263.0
22	0.028	0.711	526.0	503.0	492.0	481.0	457.0	435.0

ERSIN MULTICORE SOLDER is made in a wide range of gauges, as shown. It can also be supplied in any intermediate size. For general radio and electronic production 13, 14, 16 and 18 S.W.G. are the most widely used gauges.

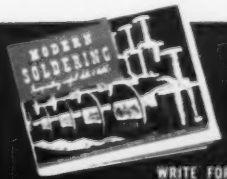
◆

FEDERAL SPECIFICATIONS

ERSIN Multicore Solder meets all requirements of Federal Specification QQ-S-571-b September, 1947 entitled "Solders Soft Tin Lead" as certified by the New York Testing Laboratory Incorporated.

◆

ALL GAUGES AND ALLOYS READILY AVAILABLE FROM NEW YORK STOCK.



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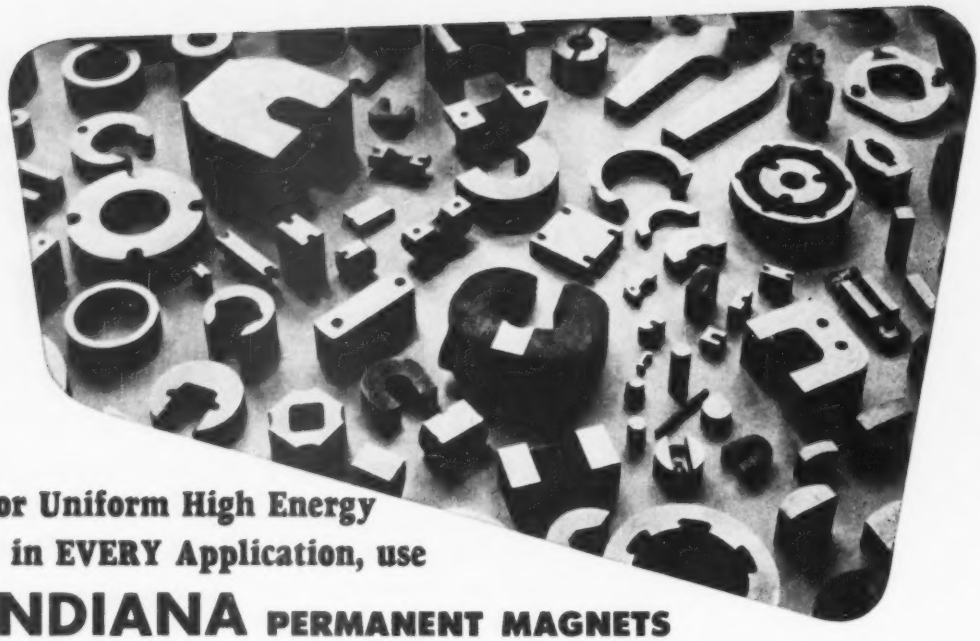

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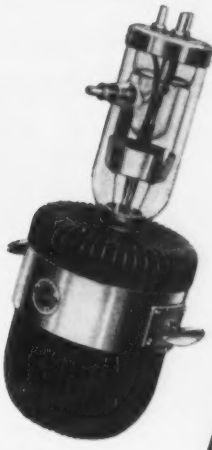
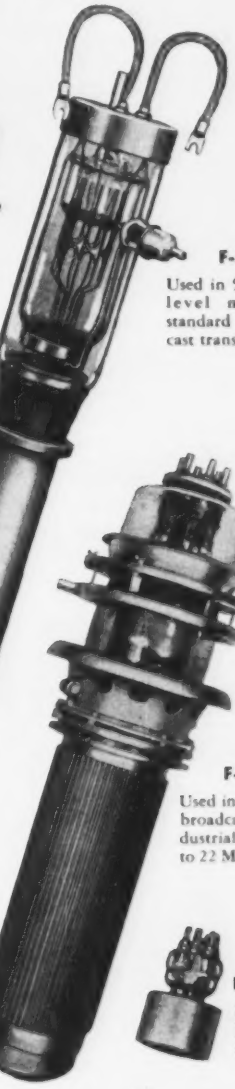
Electronic Vacuum Tubes for all power requirements: Transmitting, Rectifying, Industrial, Special Purpose, Television.



F-892-R
Used in 5 and 10 KW AM transmitters.



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Used in 50 KW low level modulated standard AM broadcast transmitters.

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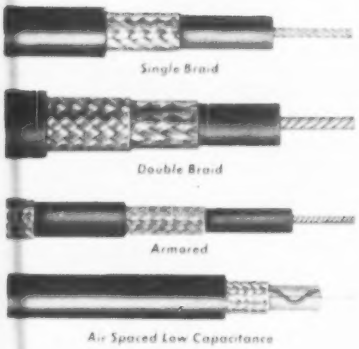

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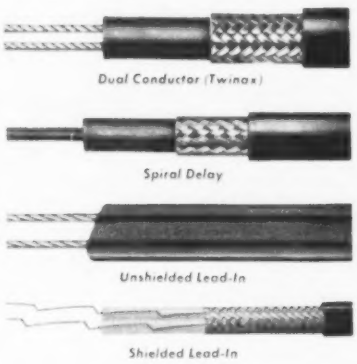

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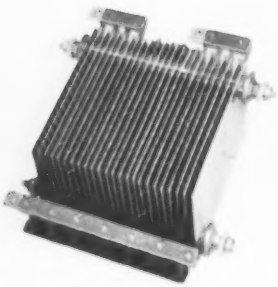

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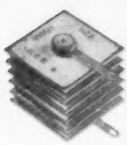

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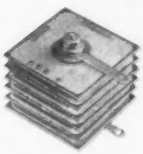
Federal Cat. No.	Code No.	Output MA-DC	Input (RMS) Volts	MA	Inverse Volts	Peak MA	Plate Size	Application
1002	402D3452A	65	130	160	380	750	1" Sq.	B+ AC-DC (5 tube) Radio
1003	402D3150A	75	130	220	380	900	1" Sq.	B+ 3-way Radios
1004	403D2625A	100	130	325	380	1200	1 13/64" Sq.	B+ Radios, Television
1005	403D2787A	150	130	425	380	1200	1 13/64" Sq.	B+ Radios, Television
1006	404D2795A	200	130	550	380	2000	1 17/32" Sq.	B+ Television
1010	404D3450A	250	130	625	380	2000	1 17/32" Sq.	B+ Television
1023	1023	350	130	900	380	3000	1¾" Sq.	B+ Television
1021	419D4200	450	130	1150	380	4000	2" Sq.	B+ Television
1014	403D2889A	100	160	325	440	1200	1 9/32" Max.	Vibrator
1022	439D4300	450	160	1150	440	4000	2" Sq.	B+ Television
1007	402D3239A	75	160*	220	440	900	1" Sq.	Vibrator Doubler
1008	403D3240A	100	160*	325	440	1200	1 13/64" Sq.	Vibrator Doubler
1009	404D3241A	200	160*	550	440	2000	1 17/32" Sq.	Vibrator Doubler
1015	402D3550	150	25	270	35	1800	1" Sq.	Bridge Rectifier
1016	403D3551	300	25	540	35	2400	1 13/64" Sq.	Bridge Rectifier
1017	404D3552	600	25	1080	35	4000	1 17/32" Sq.	Bridge Rectifier
1013	4D2814AS	700	18‡	—	—	—	1 17/32" Sq.	Battery Charger
1018	104D2943S	2000	18‡	—	—	—	4¼" lg. (Mtg. Plt.)	Battery Charger
1001	402D3151	75	20	220	55	900	1" Sq. (Mtg. Plt.)	Bias Rectifier
1019	N.T.C. Resistor (Cold, 1400 ohms, Hot, 200 ohms)						(For use with the above Selenium Rectifiers in certain circuit applications)	

*These rectifiers have two sections – characteristics given apply to one section only; if both sections are used half-wave, voltage input is 320 volts.

‡The characteristics given for this rectifier are based on its use in a full-wave rectifier circuit with a 3-cell battery load.

‡The characteristics given for this rectifier are based on its use in a half-wave rectifier circuit with a 3-cell battery load.



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Federal High Voltage Selenium Rectifiers

for Photo-Flash Power Supplies – Cathode Ray Oscilloscopes – Television Circuits – DC Power Supplies – Bias Supplies – High Voltage Testing Equipment – and other applications requiring high voltage at low current.

Federal Code Number	DC Output Voltage	Max. Peak Inverse Voltage	AC Input Voltage	Max. Eff. Inverse Voltage
123D1101	1400	4000	1400	2000
123D1071	1050	3000	1050	1500
123D1126	700	2000	700	1000
123D1182	350	1000	350	500

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1

Slip a HEYCO Nylon Strain Relief Bushing on wire. *(Heycos eliminate cord wear at chassis entrance.)*

2

Snap HEYCO into chassis hole. *(The Heyco imparts a positive non-slip grip; does not injure wire.)*

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New Property Chart of ALSIMAG®
TECHNICAL CERAMIC COMPOSITIONS

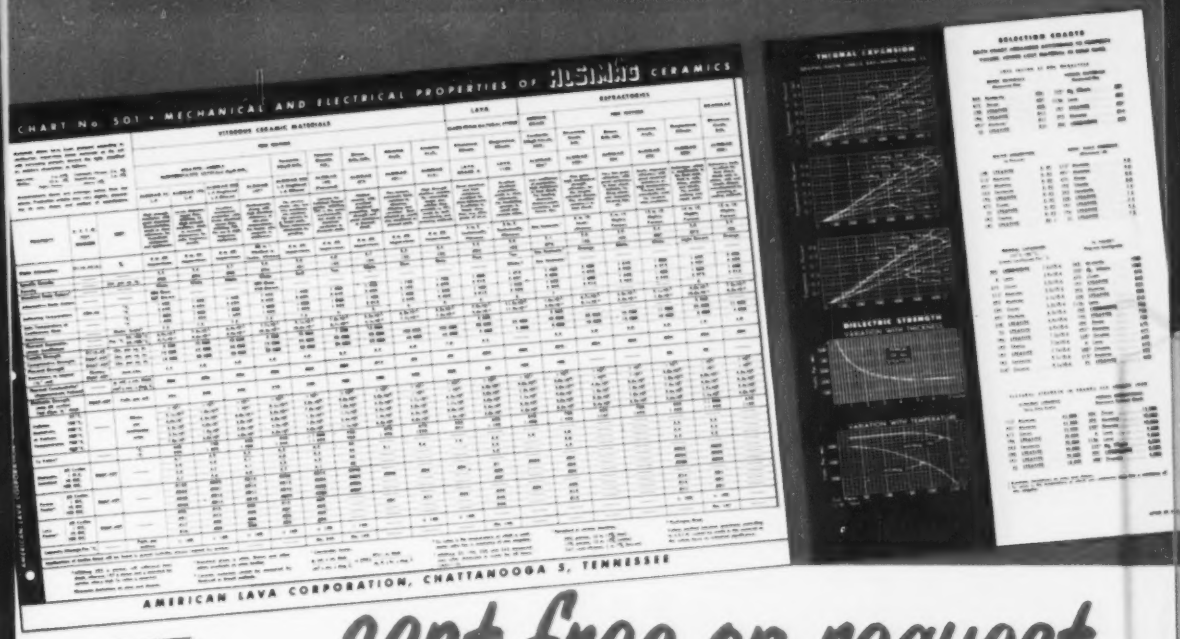
CHART No. 501 • MECHANICAL AND ELECTRICAL PROPERTIES OF ALSIMAG CERAMICS
AMERICAN LAVA CORPORATION, CHATTANOOGA 5, TENNESSEE

sent free on request

American Lava Corporation, Chattanooga 5, Tennessee, has issued a new chart giving the mechanical and electrical properties of AlSiMag custom-made technical ceramics.

WHAT ALSIMAG IS

AlSiMag is the trade name of a large family of technical ceramic compositions. These compositions have different physical, electrical, mechanical and chemical characteristics. AlSiMag ceramics are custom-made to specifications.

WHAT THE CHART TELLS

The chart covers seventeen of the more frequently used AlSiMag compositions and is the most complete chart yet issued in this field. A new feature is a selection chart which simplifies and speeds the selection of the most useful composition for the individual requirement. This selection chart indicates lower cost materials in BOLD FACE. This helps the product engineer to design for utmost economy.

Some properties, such as thermal expansion, dielectric strength, in relation to thickness and temperature are presented in graphic form.

ALSIMAG COMPOSITIONS NOT ON CHART

Many special AlSiMag compositions have been developed to meet specific conditions. These are too numerous to chart. If chart indicates general characteristics of value, modifications to suit your special application may be available.

WHO NEEDS THE CHART

Designing engineers, production technicians or purchasing agents will find chart helpful in their search for materials for unusual applications.

HOW TO GET THE CHART

The AlSiMag Property Chart is sent free on request. Request as many copies as you need to cover your organization.

WHERE ALSIMAG IS USED

AlSiMag custom-made technical ceramic parts are extensively used as:

Insulators for the electronic field • Insulators for electric appliances and other electrical applications • Thread Guides for textiles, wires, paper twine, etc. • Extrusion dies for such products as pencil leads, battery carbons, soft wires, explosives, etc. • Gas burner tips • Controlled atmosphere welding tips • Oil burner ignition insulators • Ceramics for hermetic seals • Metal-ceramic combinations • Air-acid jet nozzle inserts • Polishing heads for delicate final polishing operations • Cores and inserts for precision castings • Strainer cores for metal foundries • Cut-off cores for metal foundries • Refractory pins and plates in small sizes and special shapes • Work holders for electronic heating devices • As a replacement for parts made of plastic, wood or machined metal wherever a wear resistant part is required • In short, wherever electricity, heat, chemical or certain abrasive or friction conditions must be controlled.

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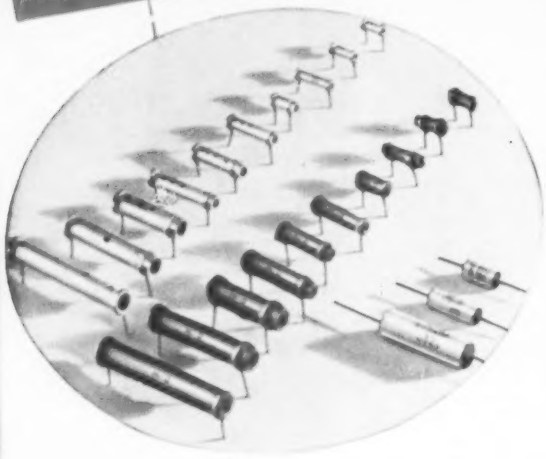
Hi-Q

PRODUCED BY THE MILLIONS



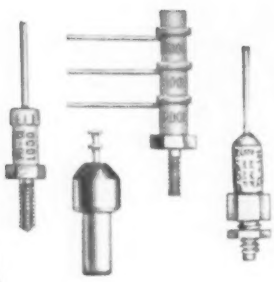
Hi-Q BC TUBULAR CERAMIC CAPACITORS

For coupling, by-passing and filtering where frequency control is not a critical parameter. Readily replace mica and paper condensers of corresponding value. (Not to be confused with Hi-Q close tolerance, temperature compensating units.) Available in capacity ranges from 5 mmf. to 33,000 mmf.

Hi-Q TEMPERATURE COMPENSATING CAPACITORS

Tubular ceramic construction with pure silver electrodes precision coated. Capacities from .25 mmf. to 1830 mmf. and a temperature coefficient range from P 100 to N 1400.

Insulation: Both Hi-Q BC Tubular and Hi-Q Temperature Compensating Capacitors are available with any of three types of insulation:—Clear non-hydroscopic styrene coating (CN) . . . Durez impregnated with low-loss microcrystalline wax (SI) . . . or a ceramic (Steatite) cover tube sealed with a specially developed end seal where applicable (CI).



Hi-Q STAND-OFF CAPACITORS

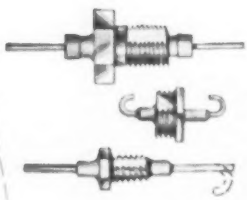
Basically, these are tubular units with a screw fixture for mounting to chassis or common ground. Type MCS has a ceramic tube enclosed in husky cadmium plated metal case with a specially developed end seal for protection against humidity and temperature changes. Close coupling and their unique construction make them excellent for by-passing RF in the high frequencies. Standard capacity tolerances are ± 10%, ± 20%, and GMV for "stand-off" capacitors and −20%, +30%, and GMV for multiple tap units. MCS has a capacity of 1500 mmf. ± 500 mmf. All units flash tested for 1000 volts DC, power factor under 3% maximum. Insulation resistance is above 10,000 megohms.

Hi-Q COMPONENTS

Capacitors
Trimmers • Choke Coils
Wire Wound Resistors

BETTER 4 WAYS

- PRECISION
- UNIFORMITY
- DEPENDABILITY
- MINIATURIZATION



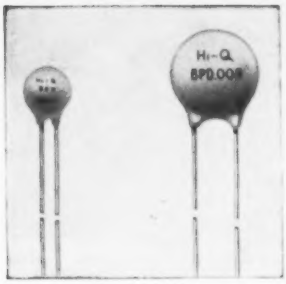
Hi-Q FEED-THRU CAPACITORS

Provide perfect transmission through shields or ground potentials and simultaneously by-pass unwanted frequencies. Extremely rugged to withstand severe vibrations such as those encountered in aircraft, missiles and automotive requirements.

Hi-Q HIGH VOLTAGE TUBULAR CAPACITORS

Available in capacities from 25 mmf. to 250 mmf. Units with working voltage of 3,000 V. D. C. are 1.840" in length and .375" in diameter. Units with working voltages between 500 V. D. C. and 3,000 V. D. C. can be slightly smaller. All are Durez coated and are selected from ceramic bodies having good dielectric characteristics.

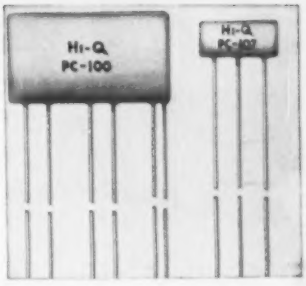
— by the top specialists in the ceramic field . . .



Hi-Q CERAMIC DISK & PLATE CAPACITORS

Hi-Q Disks are high K dielectric by-pass, blocking or coupling capacitors. Multiple capacities may be fabricated on a single disk to eliminate two or more conventional units. Insulated with Durez and high temperature microcrystalline wax for protection against moisture and high humidity. Available in a wide range of capacities and sizes.

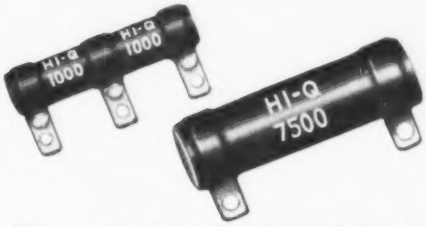
Hi-Q Plates are essentially similar to Disks other than in shape. Multiple units do *not* require a common ground as do Disks and the number of capacities on a plate is limited only by the K of the material and physical size of the unit. Guaranteed minimum capacity values up to 33,000 mmf. per sq. in. are available.



Hi-Q TUBULAR TRIMMERS

Hi-Q Steatite adjustable, high-frequency capacitors are noted for their simplicity of design, mechanical strength and electrical stability. Available in two sizes: ½" with two capacity ranges, 0.5 mmf. to 3.0 mmf. and 1.0 mmf. to 4.0 mmf.; and ⅜" with capacity 1.0 mmf. to 6.0 mmf.

Hi-Q WIRE WOUND RESISTORS



Hi-Q Resistors are made by winding special resistance wire upon a high refractory ceramic core. Element is anchored at each end to copper terminals and silver soldered for good contact. Wattage rated according to dissipation of heat each **Hi-Q** Resistor will handle without exceeding 300°C (530°F) at its hotspot from a starting ambient temperature not exceeding 40°C (104°F).

Hi-Q NON-INSULATED CHOKE COILS

Hi-Q non-insulated choke coils are a solenoid type of winding on forms moulded from mineral filled moulding material, powdered iron cores, metallic oxides such as titanium, or on a steatite core. Available in many sizes.

Hi-Q INSULATED CHOKES

Available in various values insulated either by a Steatite cover tube or with Durez and high temperature crystalline wax, assuring maximum protection against high humidity and temperature change.

Hi-Q SPECIAL WINDINGS

Available in certain types and combinations of special windings. C and L combinations of capacity and inductance are available in many values.

***Write* FOR THE Hi-Q DATALOG**

giving complete details of these and other **Hi-Q** Components. Please feel free to consult our engineers at any time concerning specific applications. We assure you of complete and fullest cooperation.

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Browning INSTRUMENTS
Engineered for Engineers

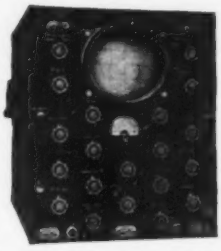
The features described here are merely the highlights of this Browning equipment . . . write for data bulletins giving detailed specifications, circuit design, and operation of these instruments.

SWEEP CALIBRATOR

For use with oscilloscopes and synchroscopes. Model GL-22A accurately calibrates sweep time intervals. Markers provided at 0.1, 1, 10, and 100 microsecond intervals may be applied as deflection or as intensity modulation. May be triggered directly from OL-15B or ON-5.

OSCILLOSYNCHROSCOPE

An outstandingly versatile instrument, Model OL-15B combines the functions of oscilloscope and synchroscope for application in laboratory and industrial testing in television, facsimile, pulse modulation, radar, nuclear physics, and communications circuits. Wide-range amplifiers assure faithful reproduction of 100 KC square wave rising or falling at 500 volts per microsecond.

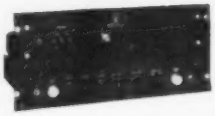


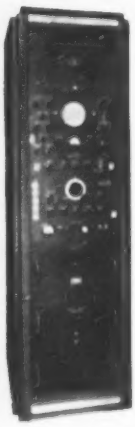
LABORATORY AMPLIFIER

Model TAA-16 is designed for use with square-law-detector probes and slotted wave-guides in determination of standing-wave voltage ratio. Operating frequencies 500 to 5000 cycles, wide band or highly selective. Full-scale readings with less than 15 μ-volts at input with wide band, 10 μ-volts with selective operation.

POWER SUPPLY

Comprising a regulated power supply and square-wave modulator for low-powered velocity-modulated tubes. Model TVN-7 is the basic unit for laboratory type micro-wave signal generator. Modulation is square-wave, FM, or pulse. Cathode voltage 280-480 volts, continuously variable, reducible to 180-300 volt range.





OJ-17 OSCILLOSYNCHROSCOPE

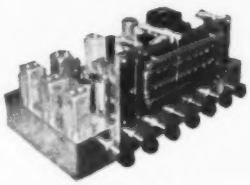
An oscillosynchroscope capable of producing satisfactory traces in work involving pulses of extremely short duration and in the study of complex wave forms having very high frequency components. The individual elements — 'scope, synchronizer, high-voltage power supply, low-voltage power supply, and control panel — are mounted in a standard vertical rack cabinet. Space is provided at the top of the cabinet for installation of a Fairchild Oscillorecord camera for making photographic records of 'scope traces. Vertical amplifier band width 16 Mc.; deflection sensitivity of .05 volts/inch at maximum gain; video delay circuit up to 0.2 microseconds. Horizontal amplifier band width 2 Mc.; deflection sensitivity .25 volts/in.

ON-5 OSCILLOSYNCHROSCOPE

A new low-priced instrument to serve as basic laboratory equipment for pulse and television work. Provides exceptional flexibility with 5 mc. bandwidth, high sensitivity, and sweep writing rate continuously variable over wide range; self-calibrating on X and Y axes; 5-inch SUPI CR tube operates at accelerating potential of 2600 volts; sweep speed controls directly calibrated.

FM-AM AND FM TUNERS

The model RJ-20 FM-AM tuner built to meet highest performance requirements has Armstrong FM circuit, full frequency response to 15,000 cycles. Separate RF and IF for AM and FM, 9 kc. and 4 kc. bandwidths. Two-stage audio system, 20 db. boost in bass or treble.



●For use with existing high-fidelity audio systems: Model RJ-12A FM-AM Tuner; Model RV-10 FM Tuner.

FM MODULATION MONITOR

Model MD-25 . . . for monitoring the modulation of all FM transmitters operating in the communications bands from 30 to 162 Mc. A simple and inexpensive means for checking fixed or mobile transmitters for compliance with FCC plus-or-minus 15 KC. limit and for reduction of adjacent-channel interference. Ranges: 30-40, 40-50, 72-76, 152-156 Mc.

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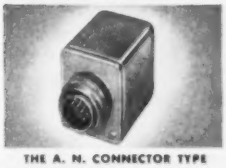
THE SCREW TERMINAL TYPE

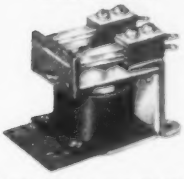
SERIES 333 RELAY



THE A. N. CONNECTOR TYPE

SERIES 395 RELAY

THE OCTAL PLUG TYPE



SERIES 610 AC—615 DC RELAY

THE LUG HEADER TYPE

Valuable information on HERMETICALLY SEALED Guardian Relays is yours for the asking. Write on your business letterhead for new completely descriptive and illustrated Catalog 5-H. No cost. No obligation.

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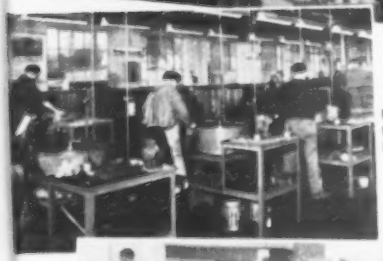

HOFFMAN PLANETARY LAP MACHINES

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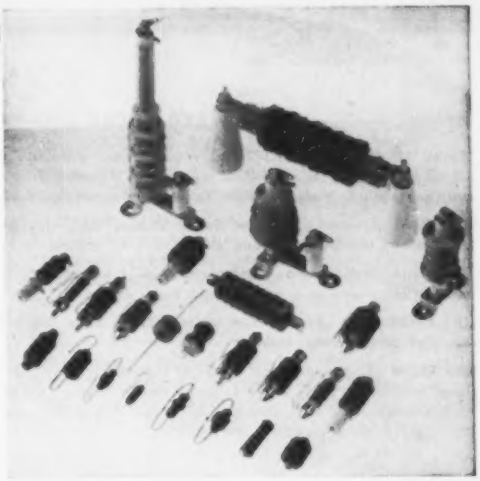
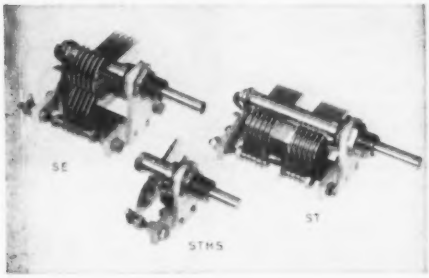


RF CHOKES: R-100 Series available in 2.5, 5 and 10 mh, rated at 125 ma. Various mounting provisions include pigtail leads, removable or non-removable stand-off insulators—end studs threaded ● R-300 Series similar to 100 but have a higher current capacity ● R-33 Series are two-sectioned in 10, 50, 100 and 750 μh. Also includes single layer solenoid choke of 1 μh. All rated at 33 ma ● R-50 Series are 3 and 4 sectioned in 0.5, 1, and 2.5 mh. Rated 50 ma ● R-60 Series, High current (500 ma) in 2 and 4 μh ● R-152 is used between 2 and 4 mc: for high power transmitter stages (80 meter band) ● R-154 Series for 20, 40 and 80 meter ● R-175 Series for parallel feed and series feed in transmitter with plate supply up to 3000 v modulated or 4000 v unmodulated.

RF CHOKES BUILT TO SPECS: Regardless of the most rigid requirements we have both the facilities and engineering staff for the quantity production of RF chokes of practically any type. Send us your specs for prices and delivey date.



RECEIVING CONDENSERS: ST Type has Straight-Line Wavelength plates. SS Type has straight-line capacity plates. All double-bearing models have front bearing insulated to prevent noise. On special order a shaft extension at each end available for ganging. On double-bearing single shaft models rotor contact is through a constant impedance pigtail. Steatite insulation. SE TYPE in 2 rotor bearings. Front bearing insulated to prevent noise. Shaft extension at each end for ganging available on special order. Single shaft extension models have rotor contact through a constant impedance pigtail. SEU TYPE is suitable for high voltages.

Type	Max. Cap.	Min. Cap.
SE	60-188 mmf.	9-13 mmf.
ST	35-150 mmf.	6-10.5 mmf.
STHS	15- 60 mmf.	3- 3.5 mmf.

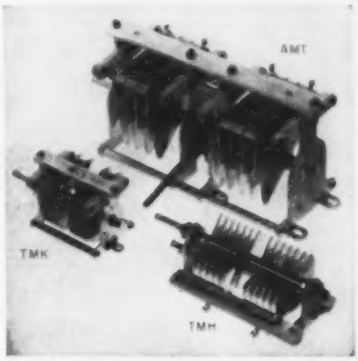
TRANSMITTING CONDENSERS

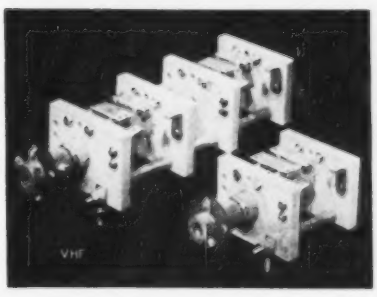
National manufactures transmitting condensers for practically all applications. In addition to the 2 described below there are Type TMS; for transmitter use in low power stages: TMK; for exciters and low power transmitters: TMH; features compact construction, excellent power factor and mounts on panel or removable stand-off insulators: TMC; is used in power stages of transmitters where peak voltages do not exceed 3000 v.

Type	Max. Cap.	Min. Cap.
TMS	100-300 mmf.	9.5-15 mmf.
TMK	35-250 mmf.	7.5-11.5 mmf.
TMH	50-150 mmf.	9-18 mmf.
Single Section AMT, TMA, TML	50-500 mmf.	13-60 mmf.
Double Section AMT, TMA, TML	50-50 to 200-200 mmf.	10-10 to 30-30 mmf.

TYPE LMT: Heavy duty type. Completely eliminates troublesome closed loops. Simplifies problem of unwanted harmonics. Rotor shaft completely insulated from end plates. Long leakage path. Plates and parts designed to prevent flashover. Available in single-stator, double-stator, or double-stator right angle center drive models.

TYPE AMT: Frame is extremely rigid with mounting feet a part of the end plates. Heavy steatite insulation. Solid aluminum type bar across top of condenser acts as a mounting for AR-18 series coils in double stator models. Double stator models available in either standard end drive (D Series) or center drive (DG Series) with ¼" dia. Shaft extension.





VHF CONDENSERS: Shaft extension at rear for ganging purposes. Dual condensers ideal for mixer-oscillator unit. Ball bearings front and back for easy rotation and freedom from back-lash ● Stators, rotors, and stator strap connections silver-plated for best efficiency ● Rigid square construction, heavy isolantite end plates ● Spade bolts allow solid connections to chassis for extreme rigidity ● Flexible insulating coupling available to connect condenser shaft to ¼" dial shaft or to connect 2 or more condensers together as ganged units ● High capacity single spaced units for general coverage ● Low capacity double spaced units for band-spread, suitable for ham use, particularly in VHF and UHF ham bands ● Stators solder construction can be removed and replaced by strap tanks for special VHF and UHF application.

		Capacity Per Section Stator To Stator	
Type	Spacing	Max.	Min.
VHF-2D	Double	6.75 mmf.	3.0 mmf.
VHF-1D	Double	6.75 mmf.	3.0 mmf.
VHF-2S	Single	22.5 mmf.	3.0 mmf.
VHF-1S	Single	22.5 mmf.	3.0 mmf.

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DIALS AND KNOBS

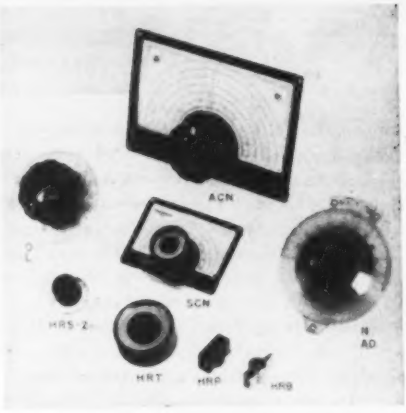
N and AD DIAL Four-inch N has engine divided scale and decimal vernier. AD has die stamped scale and employs a pointer. Planetary drive ratios of 5 to 1 contained within body of dial. Blank or calibrated scales available. Fits ¼" shaft.

ACN DIAL Original of this type dial. A National design for manufacturers and experimenters who build their own and desire direct calibration 5" H x 7¼" W.

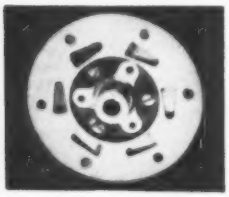
SCN DIAL Provides same dial scales as ACN but smaller. Used for panel-mounting space economy or where smaller dial is desired.

HRT KNOB Gray or black. 2⅛" in dia. Fits ¼" shaft. Has a chrome appearance circle for the modern look.

HRS KNOB Easy to grip knob molded of high quality plastic. 1⅜" dia., chrome plated bevel skirts fit ¼" shaft. Following scales available: On-off, through 30°; 5-0-5, through 180°; 0-10, through 300°; single etched line; and 0-10 through 180°. Special colors in quantity are available.



Illustrations and description shown above constitute only a small portion of complete line. Details on request.

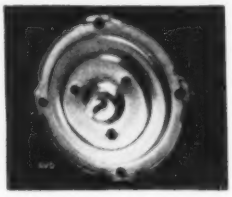


VERNIER MECHANISMS

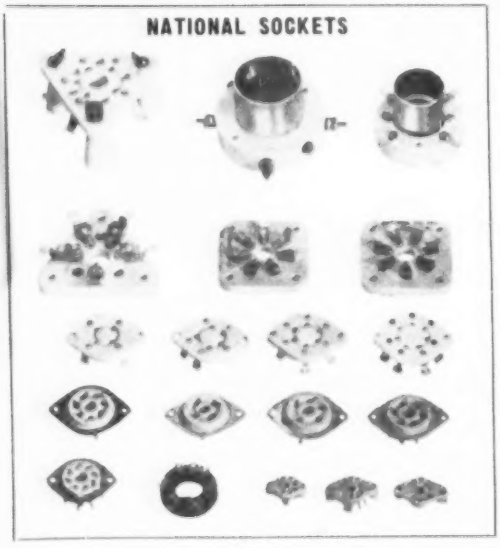
TYPE AN A vernier mechanism ratio 5-1 has an insulated output shaft coupling for ¼" shafts. Drive shaft fits 3/16" knob.

TYPE AVD Similar to AN. Output shaft coupling is non-insulated.

There are many variations of the above types available for use in commercial or industrial applications. Complete details will be provided upon request.



NATIONAL SOCKETS



SOCKETS: CIR Series feature low-loss steatite insulation, a contact that grips tube prong for entire length, and metal ring for 6 position mounting.

XC Series: Wafer sockets with exceptionally good contacts and high current capacity plus low-loss steatite insulation. Locating groove makes tube insertion easier.

HX-29: Low-loss wafer socket, steatite insulation for 829 and 832 tubes.

JX-51: Low-loss steatite wafer for tubes with giant 7-pin base.

XM-10: Heavy duty metal shell socket for tubes with UX 4-pin base.

HX-100: Low-loss wafer for tubes with giant 5-pin base. Air holes provided in socket to permit forced air cooling.

MINIATURE SOCKETS and SHIELDS

7-9 pin miniature tube sockets designed to meet rigid government and commercial requirements. Tube shields for both 7 and 9 pin sockets • Bases for shields available with spade bolts or holes for flush mounting.

XOS—A shield for miniature, both 7 and 9 pin, base tubes. Available in three sizes: 1 1/16", 1½" and 2". **XOA**: Axial type sockets.

XOR: Radial type sockets. Mount with 4-40 screws on 0.875" centers. Either ceramic or mica-filled bakelite. Provide short leads and low inductance in uhf design. Designed for 7-pin or 9-pin miniature tubes. Silver plated beryllium copper contacts.

CRYSTAL SOCKETS

SC-1, SC-2 and SC-3 are crystal mounting sockets for crystal holders with mounting pins spaced 0.5000", 0.486" and .750" and pin dia. of ⅛", 3/32" and ⅛" respectively. Steatite insulation. Single screw mountings for all models. SC-4 Ceramic crystal socket with clamp. Pin spacing .500". Pin dia. 1/32".

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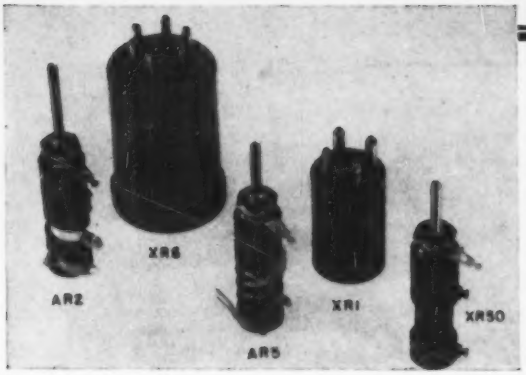


COILS AND COIL FORMS

COILS: AR-2 and AR-5 hf coils are high Q permeability tuned RF coils on low loss mica filled bakelite forms. The AR-2 coil tunes from 75 mc to 220 mc with capacities from 100 to 10 mmfd. The AR-5 coil tunes from 37 mc to 110 mc with capacities from 100 to 10 mmfd. Inductive windings supplied may be replaced by other windings as desired to modify the tuning range. XR-50 are mica filled bakelite coil forms which may be wound as desired to provide a permeability tuned coil. The form winding length is 11/16" and the form winding dia. is ½". The iron slug is ⅜" dia. by ½" long.

COIL FORMS: Molded of R-39 mica filled bakelite permitting them to be grooved and drilled. Coil form dia. 1", length 1½". XR-4 is four prong. XR-6 is six prong. Coil form dia. 1½", length 2¼". A special socket is required for the XR-6 which is National type XC-6C. Other types available are XR-1 with four prongs, XR-2 without prongs and XR-3 which has a dia. of 9/16" and length of ¾" without prongs.

HEAT RADIATING CAPS

Designed to government specifications. Aluminum contact fingers are integral with radiating fins. Tension on fingers maintained by an encircling steel spring. 6/32" tapped center hole for attaching grid ribbon or other lead. Crimped beryllium copper, silver-plated grid ribbon 3¼" long, supplied with each cap. Special lengths can be supplied to manufacturers in quantities.

GRID GRIPS AND PLATE CAPS

SPP-3 Ceramic insulation. Fits ⅜" dia. National Safety grid and plate caps have a ceramic body which offers protection against high voltage caps on tubes. The SPP-9 same as SPP-3 but fits 9/16" dia. Other types are Type 12 for 9/16" caps; Type 24 for ⅜" caps and Type 8 for ¼" caps. They provide secure and positive contact with tube caps and yet are easily released.

SHAFTS AND SHAFT COUPLINGS

National Company makes flexible couplings and shafts for practically every requirement. Features of the various types include steatite insulation; angle connections up to 90°; excellent electrical connections between coupled shafts; elimination or adjustments for radial misalignment. Most types fit ¼" shafts. Other types include TX-19; A steatite-insulated, flexible coupling for ¼" shafts, conservatively rated at 5000 v. peak. Dia. 1⅜", length 1". Length and flash over voltage can be increased by turning collars outboard: TX-23; A deluxe, insulated, flexible coupling designed for coupling ¼" shafts. Will handle a maximum radial misalignment of 1/16", also a two degree angular misalignment: TX-24; Same as TX-23 but shaft size 5/32": TX-25; Same as TX-23 but non-insulated. Complete details available upon request.

BUSHINGS

These include various types of low loss steatite bushings for ⅜" holes, ½" holes, 1" holes and 1½" holes, 2¾" holes and 3¼" holes. They include male and female bushings with metal fittings.

INSULATORS

Feed-Through Insulator

XS-9 Feed-through insulator. Hole size 13/64". Insulators are adjustable for different partition thicknesses on silver-plated terminal stud. Ceramic insulators are of high grade material designed for high frequency equipment. Other types include XS-1 (1" hole), XS-2 (1½" hole), XS-7 (⅜" hole), XS-8 (½" hole), as well as standoffs and spreaders of various sizes.

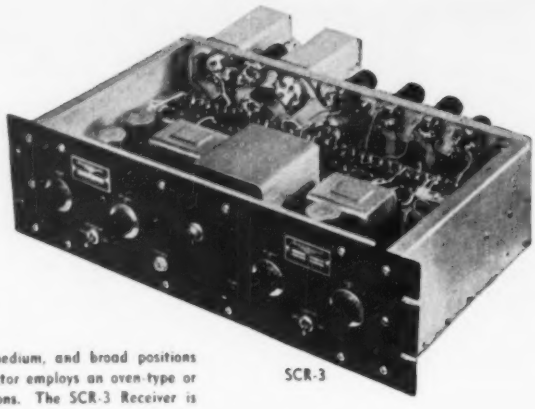
OTHER NATIONAL CO. PRODUCTS

National Company manufactures hundreds of other items in addition to the ones shown on these pages. A complete catalog is available on request. Important items include . . .

Custom IF Transformers
Standard Metal Cabinets & Panels
Coil dope Paint Hardware Television Receivers
Dial and angle drives Communication Receivers

TERMINALS: FWJ; This assembly uses the same insulators as the FWH shown to the right but has jacks. When used with a National FWF plug there is no exposed metal when the plug is in place. The FWH type: The insulators of this terminal assembly are molded R-39 and have serrated bosses that allow the thinnest panel to be gripped firmly, and yet have ample shoulders. Binding posts are sturdy. The FWG is a Victron terminal strip for high frequency use. Binding posts take banana plugs at top and grip wires through hole at bottom, simultaneously if desired. The FWF is a molded R-39 plug with two banana plugs on ¾" centers. Leads may be brought out through top or sides.

SCR-3 Single Channel Receiver



SCR-3

The SCR-3 is a single-channel superheterodyne receiver with a self-contained power supply which may be operated from either 115 or 230 volts 50/60 cycle AC supplies. It is designed to operate on frequencies from 1.8—25 mcs. Two tuned R. F. stages insure a favorable signal-to-image ratio varying from approximately 55 db at 25 mc. to 90 db at 1800 kc. Pre-tuned R. F. circuits, a crystal-controlled oscillator, carrier operated noise suppression (C.O.N.S.), and automatic volume control allow the operator to devote his full time to message handling. For C. W. reception a special low-drift voltage regulated oscillator assures proper tuning over long periods of time. Designed for standard relay rack mounting, the SCR-3 uses a 19 x 5¼" panel and is 16" deep from the rear of the panel. The selectivity of the standard SCR-3 is 4 kc. at 6 db down. If greater bandwith is desired, we can supply our SCR-3B model which incorporates a variable I. F. having sharp, medium, and broad positions ranging from 4 to 8 kc. at 6 db down. The crystal-controlled oscillator employs an oven-type or standard crystal dependent upon the severity of operating conditions. The SCR-3 Receiver is fungus-proofed to retard the harmful effects of humidity characteristic of tropical climate.

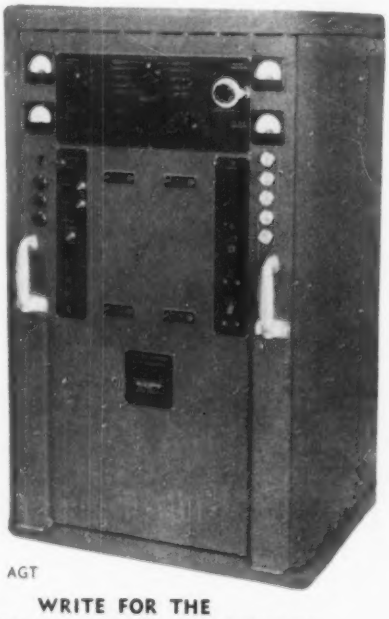
NAC National VHF Receiver

NAC

The NAC Receiver has been designed to satisfy the needs of airlines, small private airports, and other interests requiring a compact tunable VHF rack mounted receiver. The NAC is a superheterodyne, superregenerative receiver utilizing a self-contained speaker. The receiver can be used separately or as a converter with any conventional superheterodyne tuning to 10.7 mcs. This, in addition to offering increased sensitivity, makes all features of the associated receiver usable on VHF. The standard model covers frequencies from 112-153 mcs. However, coil ranges covering specific frequencies between 27 and 250 mcs. are available on special order. The NAC operates from a National SPU-5886 power supply which is designed for 115/230 volt, 50/60 cycle supplies. If portable operation is desired, either the National 686S vibrator power unit (6 volt) can be supplied or a standard 6-volt battery and B batteries supplying 135 to 180 volts may be used.

AGT Very High Frequency Transmitter

The National AGT VHF Transmitter was designed primarily for use at ground stations for ground-air communications. However, it may be used in any installation where VHF phone transmissions are required. It is designed to provide a means for amplitude-modulated phone transmission over a nominal frequency range of 111 to 126.7 mc. The transmitter is capable of delivering an R. F. carrier output of 50 watts, modulated 90%, into a 52-ohm unbalanced resistive load. The unit is crystal controlled with 5 preset channels. A novel device is utilized to assure accurate and rapid selection of any one of the 5 channels. This device is a motor-driven "Automatic Channel Selector" which permits push-button selection of any one of the 5 preset channels. An illuminated numeral indicates the particular channel in use. Provision is made in the transmitter to permit operation from a remote location and remote equipment can be supplied on special order if required. The transmitter operates from 105/125 v., 50/60 cycles single phase A. C. power source.



AGT

National

NC

EST. 1914

NATIONAL COMPANY, Inc.

MALDEN, MASSACHUSETTS

WRITE FOR THE
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For Truly Fine Recording and Reproduction

audiodiscs*

For more than a decade, Audiodiscs have consistently set the standards for quality and uniformity in every field of instantaneous disc recording. A superior lacquer, applied by a patented, precision-machine coating process, gives a mirror-smooth cutting surface with positive thread throw, brilliant h-f response, and freedom from background noise. An important improvement, perfected in 1948, makes all Audiodiscs permanently resistant to humidity.

There's an Audiodisc for every recording need—conventional or microgroove.

RED LABEL AUDIODISCS—exceed the most exacting demands for highest quality professional recordings. Aluminum base. *Double sided*—Sizes: 6½", 8", 10", 12" and 16". *Single face*—Sizes: 10", 12" and 16".

YELLOW LABEL AUDIODISCS—the popular choice for all general-purpose recording. Aluminum base. Double sided. Sizes: 6½", 8", 10", 12" and 16".

BLUE LABEL AUDIODISCS—ideal for schools, homes, and general amateur use. Same lacquer as professional discs, but thinner aluminum base. Double sided. Sizes: 6½", 8" and 10".

MASTER AUDIODISCS—the choice of professional recordists for use where pressings are to be made. Give fine results with either silvering or gold sputtering. Aluminum base. Double sided or single face. Sizes: 12", 13¾" and 17¾".

REFERENCE LABEL AUDIODISCS—provide maximum economy for test cuts, reference recordings, auditions, etc. Aluminum base. Double sided. Sizes: 10", 12" and 16".

audiopoints*

The newly expanded line of Audiopoints covers the full range of recording and playback needs—for the most exacting professional recordists as well as the non-professional and the general public. Audiopoints are available in Sapphire, Stellite and Steel—precision made by skilled craftsmen, for matchless recordings and reproduction of either conventional or microgroove recordings. Send for folder on Audiopoints.

audiotape*

Audio Devices now offers a *complete line* of highest quality magnetic recording tape—on plastic or paper base, and with red or black oxide coating, for matched performance in any tape recorder.

Audiotape is precision made to the same exacting standards of quality and uniformity that have characterized Audiodiscs for the past decade—your assurance of maximum fidelity, uniformity, frequency response, and freedom from background noise and distortion.

The following types of Audiotape are now available:

Length	Reel	Coating	Wound With	Type No.
PLASTIC BASE AUDIOTAPE (in the Red Box)				
600 ft.	5" Plastic	Black Oxide	Oxide Out Oxide In	640 641
		Red Oxide	Oxide Out Oxide In	650 651
1250 ft.	7" Aluminum	Black Oxide	Oxide Out Oxide In	1240 1241
		Red Oxide	Oxide Out Oxide In	1250 1251
2500 ft.	Std. NAB Al. Hub	Red Oxide	Oxide In	2551H
	Complete 10½" Al. Reel	Red Oxide	Oxide In	2551R
PAPER BASE ADIOTAPE (in the Blue Box)				
600 ft.	5" Plastic	Black Oxide	Oxide Out Oxide In	600 601
		Red Oxide	Oxide Out Oxide In	620 621
1250 ft.	7" Aluminum	Black Oxide	Oxide Out Oxide In	1200 1201
		Red Oxide	Oxide Out Oxide In	1220 1221

Audio Devices is also prepared to furnish Audiotape in types and sizes designed to meet individual requirements for specialized applications.

The above Audio Devices products are available through more than 300 authorized distributors, located in principal cities from coast to coast.

Audiodiscs are manufactured in the U. S. A. under exclusive license from PYRAL, S.A.R.L., Paris

AUDIO DEVICES, INC.

444 MADISON AVE., NEW YORK 22, N. Y.

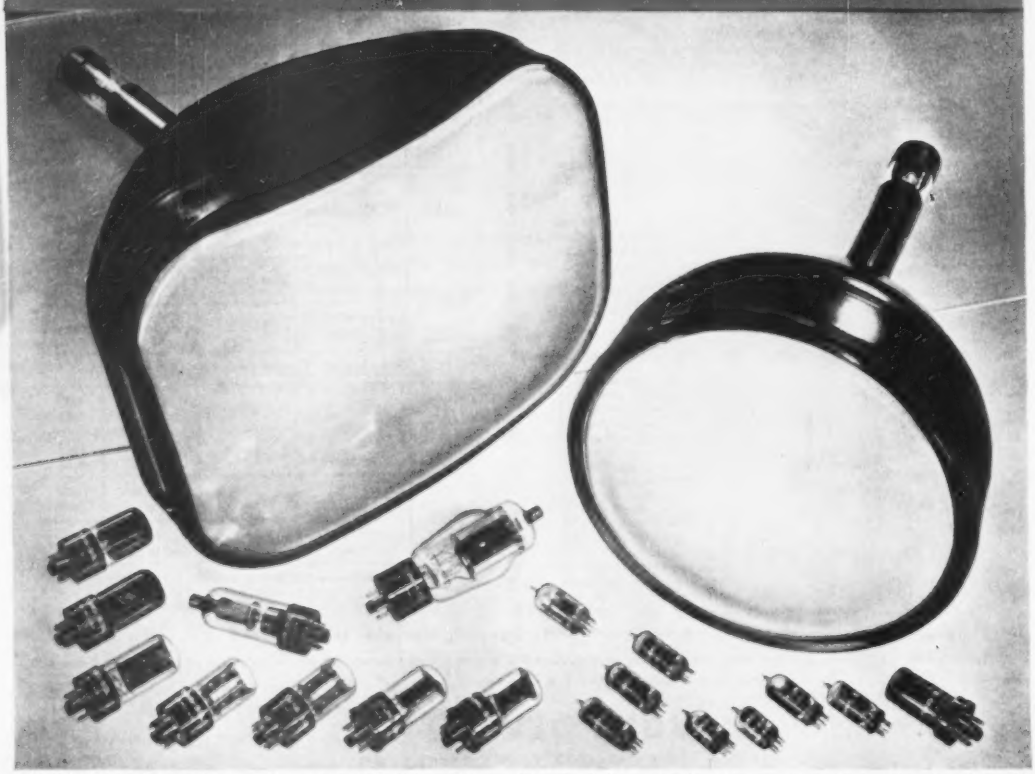
EXPORT DEPT.: ROCKE INTERNATIONAL, 13 EAST 40TH ST., NEW YORK 16, N. Y.

*Trade Mark

In 1950 TUNG-SOL will supply electron tubes to 8 of the 10 top producers of television sets.

In 1950 TUNG-SOL will build more electron tubes than at any time in the history of the company.

This growth means increased opportunities for TUNG-SOL Distributors. But equally important, this growth does not alter the TUNG-SOL policy of friendly personal relationship with every customer large or small. Our main ambition still is to be known as "a company easy to do business with."



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To be sure of *more dependable performance* from wire-wound components

STANDARD FIXED RESISTORS
from 5 to 200 Watts

ADJUSTABLE RESISTORS
from 10 to 200 Watts

OVAL RESISTORS
for limited space requirements
—from 30 to 75 Watts

FERRULE RESISTORS—for connection through fuse clips in installations where rapid insertion and removal is a factor—from 12 to 200 Watts

RESISTORS FOR SPECIAL APPLICATIONS made to order. I-T-E Power Resistors are made with a normal tolerance of 10%. Tolerances of 5% and less are made to order.

● Now you can secure modern electronic products, specially designed to meet the exacting and changing needs of the electronics industry. All I-T-E wire-wound components are *engineered for quality* — given the same thought in design, the same care in fabrication that the most complicated I-T-E Switchgear devices receive.

Whatever your wire-wound needs, it will pay you to investigate I-T-E *precision-built* products. For complete information on any of these products — or for information on special wire-wound fabrications — write us specifying your needs.

I-T-E STANDARD AND OVAL POWER RESISTORS

All I-T-E Standard and Oval Power Resistors are ruggedly constructed, fully capable of meeting the most critical conditions of heavy usage. Bases are made of best, non-hygroscopic ceramics. Terminals are tinned, double-leaf tabs, securely fastened to ceramic base tube. Resistance wires are purest obtainable; and are uniformly wound, mechanically tied, and silver-soldered for permanent, solid connections. The glazed, moisture-repellent surface is made of blue-black vitreous enamel or organic coating, if specially ordered, which locks and insulates the wire winding, and provides fast heat dissipation.

I-T-E

PRECISION-BUILT

I-T-E CIRCUIT BREAKER COMPANY

RESISTOR DIVISION, 19th & HAMILTON STS. · PHILADELPHIA 30, PA.

I-T-E *Precision Built*

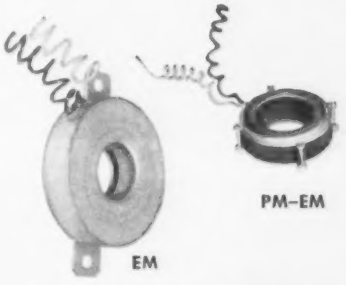
RESISTORS • DEFLECTION YOKES
FOCUS COILS

I-T-E DEFLECTION YOKES

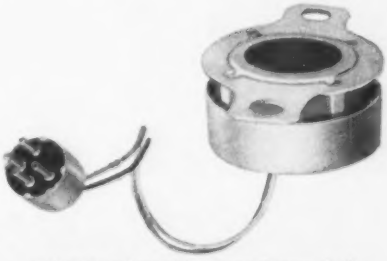
Deflection yokes are built with uniform characteristics; wire size and quality is constantly checked. The coils are impregnated in a special moisture resistant thermo plastic material properly cured to insure a firm coil with the minimum of losses. Deflection yokes may be obtained complete with wire leads, resistors and capacitors to customer's specifications.

I-T-E FOCUS COILS

I-T-E Focus Coils are available in three types: The first type utilizes an electro-magnet. The second type combines a permanent magnet with an adjustable electro-magnet. Both are wound of finest enameled uniform-cross-section copper wire. Leads are securely anchored, and the entire wound assembly is enclosed in a pressed-steel case, which is zinc-plated to resist corrosion. PM-EM construction makes possible the use of smaller and less expensive power supply, retains proper focusing longer, and minimizes temperature rise. I-T-E Focus Coils are made for use with tubes 10", 12", and 16" in size. Information required to manufacture: Type of tube; second anode voltage; focusing current. Mountings and leads are made to specifications.



The third type I-T-E focus coil is a PM-EM coil in which an adjustable shunt is used to adjust the amount of permanent magnetization. Combination of the adjustable PM with the electro-magnet gives you a wider range of adjustment, enables serviceman to better adjust focus coil to meet requirements of local conditions. Components are all cadmium plated to prevent corrosion. Offers all the benefits of PM-EM construction. Recommended for 16" and 19" tubes.



PM-EM Adjustable Shunt Focus Coil

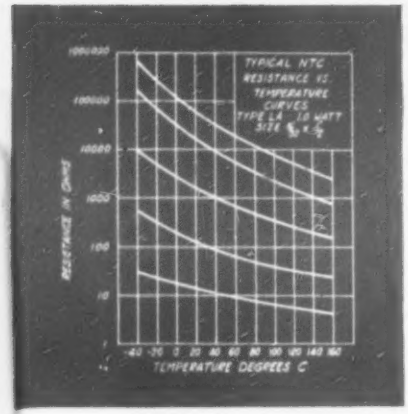
WIRE WOUND PRODUCTS

SWITCHGEAR • UNIT SUBSTATIONS • ISOLATED PHASE BUS STRUCTURES

AUTOMATIC RECLOSING CIRCUIT BREAKERS • RESISTORS • SPECIAL PRODUCTS

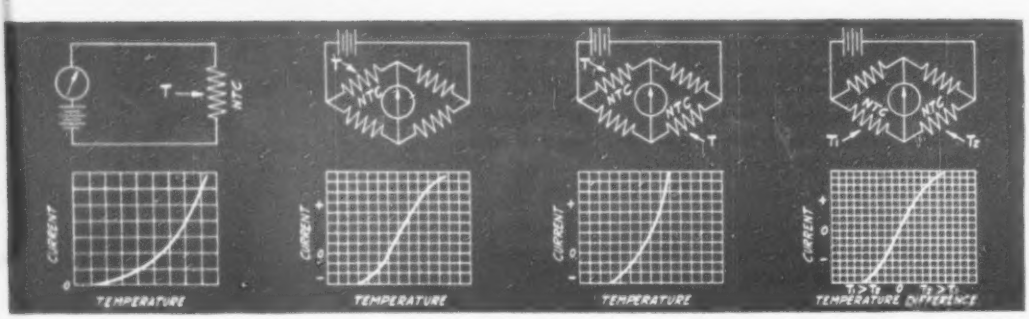
Do you have a

TEMPERATURE MEASUREMENT OR CONTROL PROBLEM?



CHECK THESE ADVANTAGES OF KEYSTONE NTC UNITS FOR YOUR APPLICATION

Keystone NTC units are electrical resistors especially developed to have an unusually high negative temperature coefficient of resistivity. The slopes are much greater than those observed with pure metals or their alloys. The result is an element with very high thermal sensitivity, useful on AC or DC, inherently suitable for remote indication, which has gained wide acceptance for temperature measurement and control purposes. NTC units are made in wide range of shapes, resistance values, temperature coefficients and wattage ratings, of which the characteristics at the left are typical. The circuits below suggest basic means for translating resistance changes into current or voltage variations. Modifications and extensions of these principles are many, especially in conjunction with electronic apparatus.



This simple series circuit of voltage source, instrument and NTC unit has been utilized to indicate engine coolant temperature, etc. It provides sufficient accuracy for many applications despite scale crowding at the bottom.

Basic bridge circuit straightens and steepens the characteristic. Zero-center meter may be used or balance point may be placed near the lowest temperature. Electronic balance indication provides enhanced sensitivity.

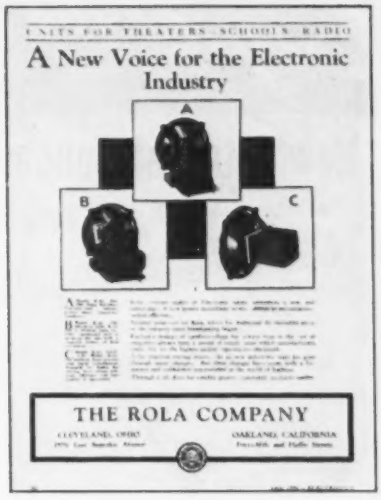
Adding a second NTC unit, and exposing both to the temperature to be indicated, gives a double unbalancing effect and increases sensitivity under certain conditions over part of the temperature range.

Two NTC units in adjacent arms is a method of indicating equality of two temperatures, or temperature difference or rise. Temperature of either source can be obtained by substitution of standard resistance for other NTC unit.

Keystone NTC resistors are also valuable for neutralizing the change in resistance with temperature of electrical indicating instruments and control devices, for introducing time delays and many other applications. Write and tell us about your problem—we'll be glad to analyze it for the applicability of NTC units.

KEYSTONE CARBON COMPANY, INC.
SAINT MARYS . . . PENNA.

Here is a reprint of the Rola ad run in the April 1930 issue of *Electronics*


UNITS FOR THEATERS · SCHOOLS · RADIO

A New Voice for the Electronic Industry

A

B

C

THE ROLA COMPANY

CLEVELAND, OHIO

OAKLAND, CALIFORNIA

ROLA

...HAS BEEN IN THE SPEAKER BUSINESS FOR 20 YEARS

A combination of fine products, plus fair prices and good service has enabled Rola to stay in business for two decades.

Speakers ...today are

- SMALLER
- LIGHTER
- BETTER
- LOWER PRICED

THAN THEY WERE 20 YEARS AGO

Rola also makes a complete line of transformers for radio and television sets and also other component parts for TV receivers.

THE ROLA COMPANY INC.

Division of The Muter Company
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Export Ad. Auriema, Inc.
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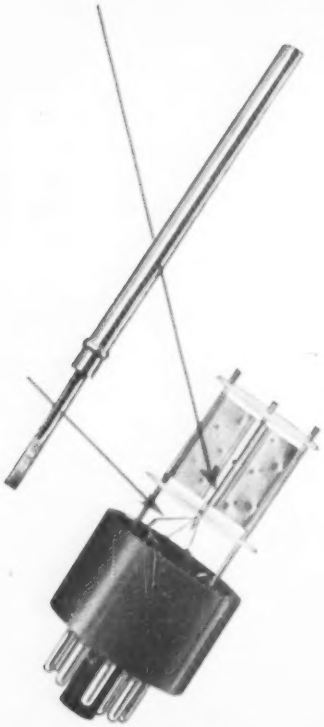
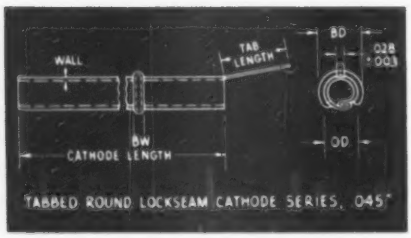
Superior TUBE COMPANY

New Integral Tabbed Round Lockseam* Cathodes

FOR ELECTRON TUBE MANUFACTURERS





TABBED ROUND LOCKSEAM CATHODE SERIES, .045"

Newest Superior development in components for television and other electronic tubes, these LOCKSEAM cathodes are produced from thin nickel alloy strip stock by machines developed especially for the purpose.

The tabs are integral with the tube, eliminate the welding step hitherto required, and may save the tube manufacturers as much as $1.00 per thousand cathodes, as well as speeding production.

They are available in the following alloys to meet specific requirements. (All numerical designations are those of The International Nickel Company (Inco), except those marked *D-H* which are Driver-Harris designations.)

"ACTIVE" alloys for high level of DC emission: 225, D-H 599

"PASSIVE" alloys for freedom from grid emission (low rate of free barium yield): D-H 499, D-H 999

LENGTHS AND DIAMETERS AVAILABLE

The following Integral Tabbed Lockseam Cathodes are in regular production:

Superior Part No.	O.D.	Wall	Cathode Length	Tab Length	Used in Tube Type
LT45R2-7	.045"	.0021"	23 MM	9 MM**	6BA6
LT45R2-8	.045"	.0021"	27 MM	9 MM**	6SN7GT
LT45R2-9	.043"	.0021"	11½ MM	6½ MM*	6AL5
LT45R2-10	.045"	.0021"	23 MM	9 MM*	6BA6
LT45R2-11	.045"	.0021"	27 MM	9 MM*	6SN7GT
LT45R2-12	.045"	.0021"	11½ MM	6½ MM**	6AL5

*Manufactured under U.S. Pats., S.T. Co.

* —Tab at beaded end of Cathode.
** —Tab at unbeaded end of Cathode.

ELECTRONICS DIVISION

New Components to Speed Tube Assembly Operations

METAL EXHAUST TUBES. Television tube manufacturers faced with breakage and other tube exhaust problems, will welcome this new Superior development. Metal exhaust tubes offer these worthwhile advantages.

1—Quicker tip-off. Since no heating is required these metal tubes may be tipped-off **faster** than glass exhaust tubes.

2—No breakage. Good grain structure and the close dimensional tolerances to which these tubes are drawn eliminate splitting or cracking in the tip-off operation.

3—No danger of gas being drawn into tube during tip-off. The excess tube is severed *after* the sealing operation is complete.

ANODES—Type 305 (18-12) Stainless Steel, Nickel, Monel†, or Inconel† cylinders (#1 grid, #2 grid, anode), straight or angle cut, with rolled end, in lengths and diameters to your specifications. The industry standard is .500" +.0015" —.0005" I.D. x .010" — ±.001" wall.

To these, add the following "old" features which have made the Superior assembly outstanding, and you have a product that is indeed "superior":

1—Double beaded construction for attaching the ceramic insulator to the nickel shank. This insures the minimum loss of heat, and gives you a construction that will not come loose during use.

2—The "E" dimension (distance between top of ceramic and top of emission cap) is held to the very rigid tolerance of ±.0005". This cuts down considerably on the number of spacer combinations that have to be used, and means better cut-off characteristics.

3—The emission cap has no flange—does not touch the ceramic insulator at all—thus eliminating any additional danger of heat loss.

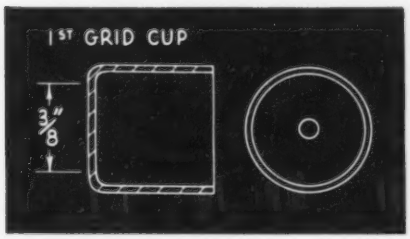
DISC CATHODE ASSEMBLY—The Superior Disc Cathode, which has proved so satisfactory during the past several years, has been improved by the addition of the following *new* features:

1—The end of the nickel shank opposite the emission cap has been given a slight flare. This insures much easier insertion of the coated heater wire and cuts down considerably on heater shrinkage.

2—The emission cap has been sand blasted, to assure better and more uniform adhesion of the coating.

This new, improved Disc Cathode is detailed in Superior print ED3—write for your copy.

DEEP DRAWN FIRST AND SECOND GRID CUPS—Superior's latest development—Deep Drawn Cups—for the first and second grids in television tube guns. The use of this one-piece construction means a considerable saving in time and materials, when compared to the two and three-piece constructions used heretofore.



Available in Type 305 (18-12) Stainless Steel, and in standard sizes, these grid cups are manufactured to Superior's usual close dimensional tolerances. They allow faster, easier assembly, give more uniform results.

The #1 Grid is detailed in Superior print EP-34 and the #2 in Superior print EP-35. Write for your copy today.

†U. S. Trademark—The International Nickel Co.

Export Representatives: Driver-Harris Company, Harrison, New Jersey, and affiliated European Companies • Harrison 6-4800

Superior

all analyses .010" to ⅛" O.D.
Certain analyses (.035" max. wall) to 1⅛"

SUPERIOR TUBE COMPANY

Electronics Division

2501 Germantown Ave., Norristown, Pennsylvania

JELLIFF RESISTANCE WIRES are very much AT HOME IN A HOT SPOT

ALLOY	OHMS PER CMF	MAX. OP. TEMP.	WIRE DIAM. RANGE	FORMS†	USES
1000	1000	500°F	0.0010 0.0009	W-R	Compact, stable precision Resistors
KANTHAL*	872	2460°F	*	W-R-S	Ultra-High temp. continuous service
C	675	1700°F	0.2890 0.0008	W-R	Appliances and Resistors
A	650	2100°F	0.0410 0.0010	W-R	High-temp. Furnaces and Resistors
45	294	930°F	0.2890 0.0010	W-R	Precision Applications

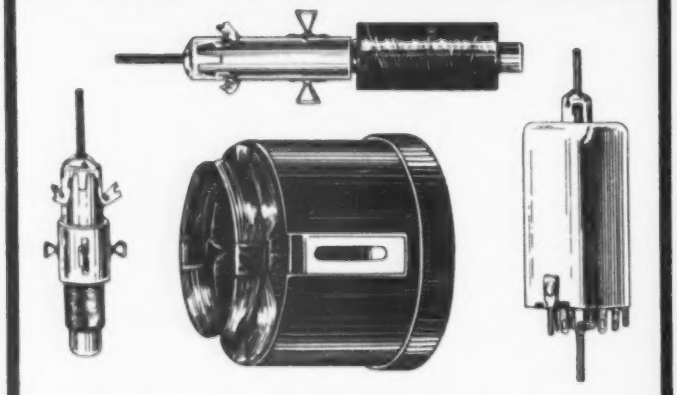
†—W, wire—R, ribbon—S, strip. *—several different alloys

Whether the *heat* is literal (up to 2460F), or figurative in the sense that performance under difficult conditions is a "must", we have an alloy for almost any conceivable requirement. The above Table may suggest possible applications to your products.

Complete Technical Data are available from Department 17.

THE C. O. JELLIFF MANUFACTURING CORPORATION SOUTHPORT, CONN.

HILLBURN



Manufacturers of Coils & Transformers

- I.F. Coils and Transformers
- Deflection Yokes
- Linearity and size Coils
- Peaking Coils and Plate Chokes
- Others from stock or specification

HILLBURN ELECTRONIC PRODUCTS, 55 NASSAU AVE., BROOKLYN 22, N. Y.

Airtron

DESIGNS AND PRODUCES

Microwave Components

Flexaguide (Flexible guide)
Bends—Flexaguide & Rigid
Twists—Flexaguide & Rigid
Crystal Mixers • Duplexers
Coax to Waveguide Adapter
Directional Couplers
Tapers—Flexaguide & Rigid
Flanges

Aircraft Accessories

Ignition Manifolds
Conduit
Fittings
Spark Plug Elbows
Connectors
Power Cable Disconnects
Junction Boxes
Thermocouple Connectors
Wired Assemblies

Airtron INC.

105 East Elizabeth Ave., Linden, New Jersey

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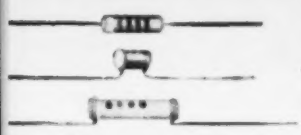
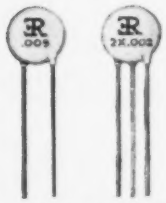
Baltimore Los Angeles New York
Boston St. Louis Dallas Dayton

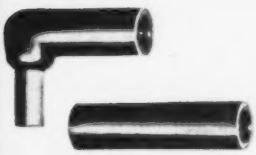


rie "GP" Molded Insulated Ceramicons
5 MMF—5,000 MMF
rie "GP" Dipped Insulated Ceramicons
5 MMF—5,000 MMF.
Erie "GP" Non-Insulated Ceramicons
5 MMF—5,000 MMF.

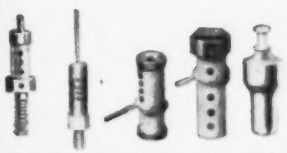


Erie Disc Ceramicons
Up to .01 MFD

Cinch-Erie Plexicon Tube Sockets with 1,000 MMF built in by-pass condensers



Types L-4, L-7, S-5 Suppressors for Spark Plugs and Distributors



Type 720A | **Types 323 and 324 Insulated** | **Type 2322** | **Type 2336** | **Type 325**

Erie Stand-Off Ceramicons
5 MMF—5,000 MMF

Button Mica Condensers
15 MMF—6,000 MMF

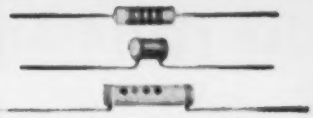
Type 557 Ceramicon Trimmer
1.5-7 MMF
3-12 MMF
5-25 MMF
5-30 MMF
8-50 MMF

Type 554 Ceramicon Trimmer

Type 531 and 532 Tubular Trimmers
0.5-5 MMF
1-8 MMF

Type TS2A Ceramicon Trimmer
1.5-7 MMF 3-13 MMF 4-30 MMF
3-12 MMF 5-20 MMF 7-45 MMF

Type 535 Tubular Trimmer
.75-3 MMF

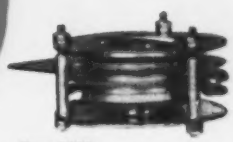


Temperature Compensating Molded Insulated Ceramicons*
0.5 MMF—550 MMF
Temperature Compensating Dipped Insulated Ceramicons
0.5 MMF—1,800 MMF
Temperature Compensating Non-Insulated Ceramicons
0.5 MMF—1,800 MMF

Type 357

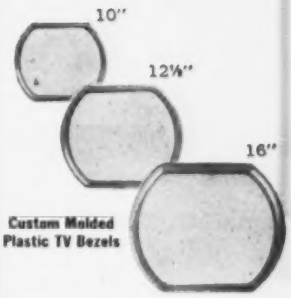
Type 362

Feed-Thru Ceramicons
5 MMF—1,000 MMF
5 MMF—1,500 MMF

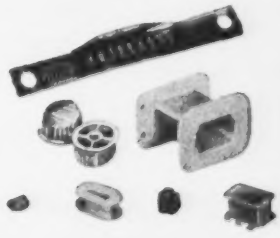


Type 3688

High Voltage Ceramicons
Up to 15,000 Volts
WORKING



Custom Molded Plastic TV Bezels



Custom Injection Molded Plastic Knobs, Dials, Bezels, Name Plates, Coil Forms, etc.

for better electronic products...
ERIE RESISTOR COMPONENTS

The dependability and accuracy to close tolerances required for Television and Broadcast applications are combined in Erie Ceramicons with compact design, tubular in form, for easy installation on the assembly lines.

Erie manufactures a complete line of Ceramic and Button Mica Condensers for transmitter and receiver applications: Carbon Suppressors, Custom Injection Molded Plastic Knobs, Dials, Bezels, Name Plates and Coil Forms. Our engineering department will work with you in developing specially designed components for efficient space-saving subassemblies. Complete technical information on request.

**Ceramicon, Hi-K, GP, and Plexicon are registered trade names of Erie Resistor Corporation.*

Electronics Division

ERIE RESISTOR CORP., ERIE, PA.

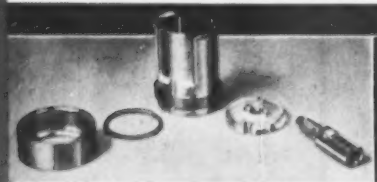
LONDON, ENGLAND • TORONTO, CANADA

GENERAL RADIO announces a COMPLETE Integrated Line of U. H. F. Measuring Equipment

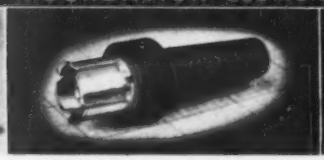
FOR MEASUREMENTS OF POWER · VOLTAGE · IMPEDANCE · ATTENUATION · STANDING-WAVE RATIO

These coaxial elements, each simple in itself, can be combined easily and quickly into many different measurement set-ups. A relatively small investment in these versatile parts provides equipment for most U.H.F. measurement problems. Characteristic impedance is 50 ohms wherever possible, and the Universal **Type 874** Coaxial Connector is used throughout.

FOUNDATION ELEMENTS

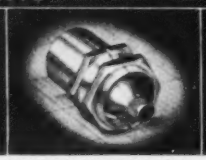


874-B BASIC CONNECTOR — $1.50
For use on rigid 50-ohm, air-dielectric coaxial lines



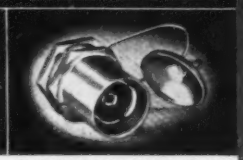
874-C CABLE CONNECTOR — $2.00
For use on G-R Type 874-A2 Polyethylene Cable

874-CB CABLE CONNECTOR — $2.00
For use on Army-Navy Type RG-8/U Cable



874-P PANEL CONNECTOR — $2.25.
For use on panels. Rear end fits Type 874-A2 Cable

874-PB PANEL CONNECTORS — $2.25
For use on panels. Rear end fits Army-Navy Type RG-8/U Cable



874-PC PANEL CONNECTOR WITH CAP — $2.75. For use on panels. Hinged cap shields connector when not in use. Rear end fits Type 874-A2 Cable. **874-PCB PANEL CONNECTOR WITH CAP — $2.75.** Same as 874-PC except rear end fits Army-Navy Type RG-8/U Cable

874-Q1 ADAPTER TO TYPE N — $6.00. Plugs into Army-Navy Type UG-22/U and similar jack-type connectors

874-Q2 ADAPTER TO G-R TYPE 274 — $5.00. Makes output of a coaxial system available at pair of ¾-inch-spaced binding posts or banana plugs

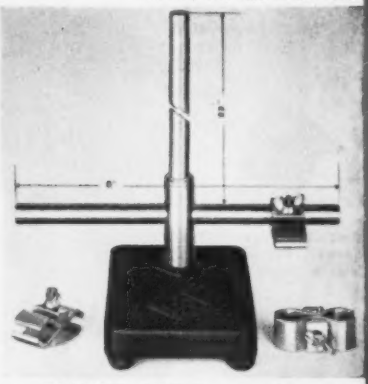
874-Q7 ADAPTER TO G-R TYPE 774 — $5.00. Plugs into any G-R Type 774 Connector

874-B20 PATCH CORD — $8.00. Three feet of Type 874-A2 Polyethylene Cable with a Type 874-C Connector on each end

874-A2 POLYETHYLENE CABLE — $0.50/ft., $27.00/100 ft. Bulk cable — characteristic impedance of 50 ohms ±5% — double shielded — good mechanical flexibility

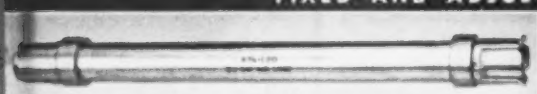
874-R31 PATCH CORD — $4.50. Three foot, flexible coaxial cable terminated with Type 874 Connector and phone tips

874-R32 PATCH CORD — $5.25. Similar to Type 874-R31, with a Type 274-ND Shielded Plug in place of phone tips



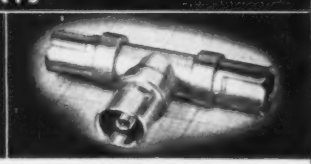
874-Z STAND — $12.50. To support the parts of a wide variety of coaxial systems — heavy bronze base — 22-inch vertical and 8-inch horizontal brass rods — three universal clamps — no rust or corrosion

FIXED AND ADJUSTABLE LINE ELEMENTS

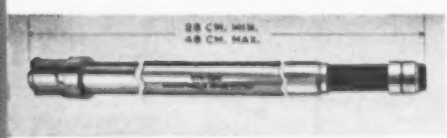


874-L10 50-OHM AIR LINE (10 CM) — $10.00
874-L20 50-OHM AIR LINE (20 CM) *(illustrated)* **— $11.00**
874-L30 50-OHM AIR LINE (30 CM) — $12.00
To space stubs or other elements of a coaxial system

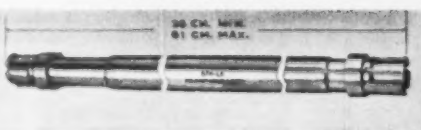
874-EL 90-DEGREE ELL — $6.50



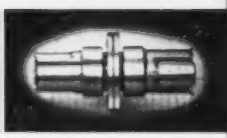
874-T TEE — $8.50



874-D20 ADJUSTABLE STUB (20 CM) — $15.00
874-D50 ADJUSTABLE STUB (50 CM) — $16.00
For matching or tuning, and use as reactive elements. Coaxial lines with sliding short circuit moved by bakelite tube. Reference marker facilitates use as wavemeter with scale



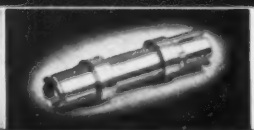
874-LA ADJUSTABLE LINE (Line Stretcher) **— $18.00**
Telescoping line — length change: 25 cm



874-JR ROTARY JOINT — $8.50

FILTERS

874-F500 500-MC LOW-PASS FILTER — $22.50
874-F1000 1000-MC LOW-PASS FILTER *(illustrated)* **$22.50**
Used to improve accuracy by reducing harmonics from U.H.F. generators

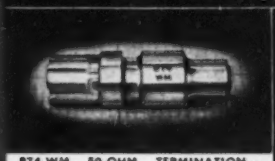


874-K COUPLING CAPACITOR — $12.00
Short coaxial line with 0.005 microfarad capacitor in series with inner conductor — transmits h.f., blocks d.c.

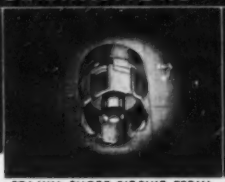
GENERAL RADIO COMPANY

Versatile, Inexpensive Components • New Universal Connectors Eliminate Male-Female Adapters • Exceptionally Convenient • Excellent Electrical Characteristics • Ideal for Proposed U.H.F. T-V Band

TERMINATIONS



874-WM 50-OHM TERMINATION — $8.00. Provides good impedance match from D.C. to several thousand megacycles. SWR less than 0.6 db up to 2,000 Mc, 1.0 db up to 4,000 Mc



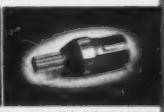
874-WN SHORT-CIRCUIT TERMINATION — $3.50. A fixed shorting strap mounted in a connector

874-WO OPEN-CIRCUIT TERMINATION — $3.00. A shielding cap for open-circuited lines

COUPLING ELEMENTS

874-LR RADIATING LINE — $12.00. Short coaxial line with hole in outer conductor that can be partially or completely covered by a rotatable sleeve — for coupling to external wavemeter or heterodyne frequency meter

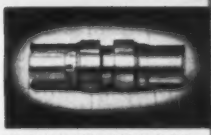
874-MA ADJUSTABLE COUPLING LOOP — $7.50. One-turn loop on coaxial line — collet supplied for panel mounting



874-MB COUPLING PROBE — $5.00. Binding post, acting as a probe, mounted on connector

ATTENUATORS

874-GA ADJUSTABLE ATTENTUATOR — $35.00. Mutual inductance (wave-guide-below-cutoff) type attenuator — attenuation is adjusted by turning sleeve — micrometer-type indication — direct reading in db



874-GF FIXED ATTENUATOR (20 DB PAD) — $10.00. P-type resistance attenuator for frequencies from dc to several thousand megacycles

POWER MEASURING EQUIPMENT

1651-A BOLOMETER BRIDGE. For conveniently measuring h-f power by either d-c substitution or direct-reading method with the following three bolometer units:

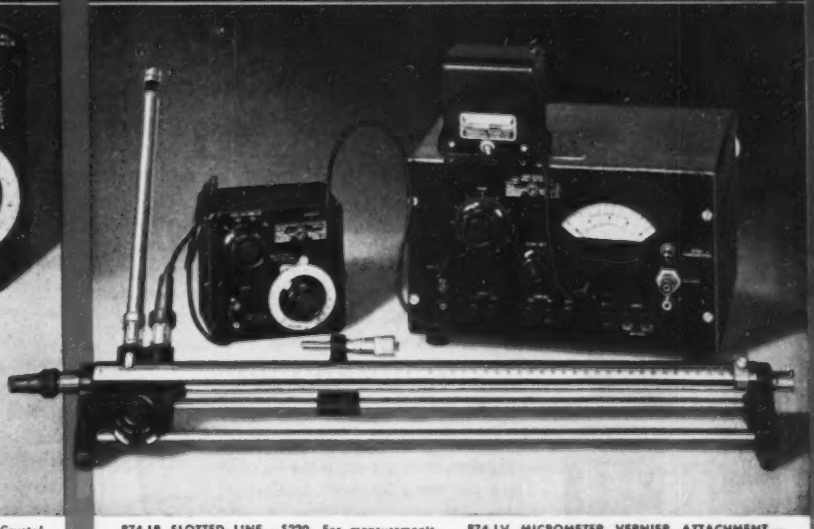
874-H25* THERMISTOR UNIT (25 MW) — $40.00
874-H100* THERMISTOR UNIT (100 MW) — $40.00
Thermistors in coaxial holders with by-pass condenser — useful from 5Mc to several thousand Mc
874-HF* FUSE BOLOMETER HOLDER — $34.00
Similar to thermistor units, but for fuse bolometers — fuse assortment supplied
**External appearance of all three similar — illustrated at lower left*
874-WL LAMP TERMINATION — $5.00. Flashlight bulb for rough power indication — 50 to 100 mw *(lower right in photo)*

VOLTAGE MEASURING EQUIPMENT

874-VR VOLTMETER RECTIFIER — $25.00. Crystal rectifier across short coaxial line — useful frequency range 15 Mc to 2,500 Mc — resistor in series with inner conductor provides 50-ohm source impedance — also useful as detector *(illustrated at bottom)*

874-VI VOLTMETER INDICATOR — $65.00. Crystal current indicator and calibrator for Type 874-VR Voltmeter Rectifier. Range: 0.1 to 2 volts — regulated 60-cycle calibration voltage

STANDING-WAVE RATIO MEASURING EQUIPMENT



874-LB SLOTTED LINE — $220. For measurements of standing-wave ratio and impedance — 300 to 5,000 Mc — variations in probe coupling along line less than ± 2½ per cent — unique simplicity of design — detector: crystal rectifier supplied, or suitable receiver — (Type 874-D20 Adjustable Stub shown in illustration plugged into slotted line tunes crystal) — slow-motion drive readily disengaged for free sliding

874-LV MICROMETER VERNIER ATTACHMENT — $30.00. For measurement of high standing-wave ratios by the "width-of-minimum" method
1231-B AMPLIFIER AND STANDING-WAVE INDICATOR — $210.00. Amplifies and indicates slotted-line crystal detector output in db
1231-P4 ADJUSTABLE ATTENUATOR — $32.50. For increasing the range and accuracy of standing-wave measurements with Type 1231-B Amplifier
1231-P2 TUNED CIRCUIT — $20.00. 400- or 1000-cycle filter, frequency selected by switch

WRITE FOR A COPY OF THE JANUARY, 1950 GENERAL RADIO *EXPERIMENTER* FOR COMPLETE INFORMATION

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THIS MAY BE THE ONE
Designed for low cost NE-51 Neon

- Built-in Resistor
- Patented
- U/L Listed
- Rugged

Catalogue Number 521308 — 997 for 110 or 220 volts.

SAMPLES for design purpose NO CHARGE

NEW! Write for the "HANDBOOK OF PILOT LIGHTS."
Write us on your design problems.

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Foremost Manufacturer of Pilot Lights.
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Save time and trouble. Use this catalog's complete listing and descriptions to find exactly the battery you need for any conceivable purpose.

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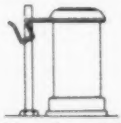
A SUBSIDIARY OF THE RAY-O-VAC RAY-O-VAC COMPANY
MADISON 3, WISCONSIN

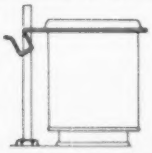
TOP HAT RETAINERS

for plug-in components

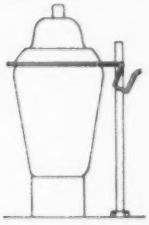
For miniature tubes



For Metal or GT tubes



For relays, condensers, vibrators, etc.



For tubes with ST-12, 14, 16 or 19 envelopes

Stainless steel clamps for plug-in units subject to vibration.

Give **positive, resilient** clamping action.

Do not interfere with **natural air circulation.**

May be applied to practically **any plug-in device.**

Materials and finishes comply with Armed Forces specifications.

Recommended for use in military electronic equipment.

Write for circular covering complete line of Top Hat Retainers.

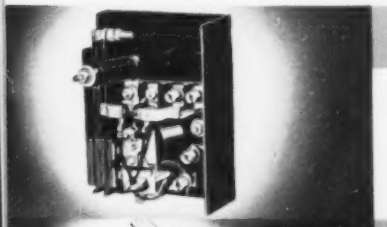
TIMES FACSIMILE CORP.
Designers and Manufacturers of Facsimile Communications Equipment
A Subsidiary of The New York Times Company
229 West 43rd Street, New York 18, N.Y.

how to find the RELAY you can promptly forget

From the wide assortment of types and sizes in the Ward Leonard line of relays, you can easily select the one that will operate in your equipment with complete dependability.

Ward Leonard Relays are extra sturdy to insure positive action and to prevent misalignment of parts by electrical or mechanical shock. They are built on molded phenolic or metal bases with posts securely anchored in the base.

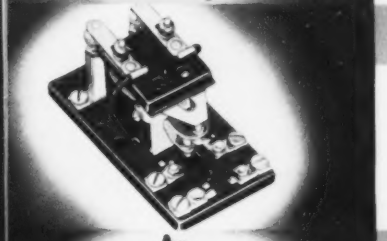
Oversize silver-to-silver contacts with high contact pressures and wiping action insure positive, low-resistance make and break. All parts are insulated against high voltage. Metal parts are plated for protection against corrosion.



thermal time delay relays — type 353

Bi-metallic thermostat control automatically compensates for ambient temperature changes. Continuous-duty, low-power coils. Timing is adjustable over a range of 5 to 45 seconds.

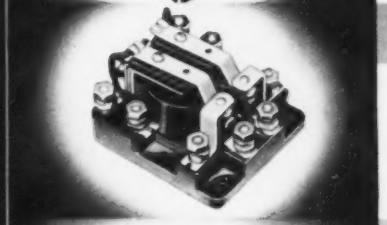
Single pole, single break, double throw. Fully-enclosed. For 115 v, 60 Cy. AC operation. BULLETIN 353.



heavy-duty relays — type 130

All Ward Leonard 130 Relays are built to one basic design which permits using standard interchangeable components. This means—you can get what amounts to a *special* relay for the price of a standard.

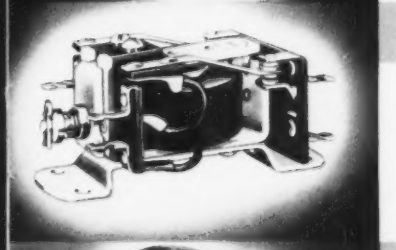
TYPES—Single pole: single break or double break. Double pole: single break or double break with common feed. Three and four pole combinations. BULLETIN 130.



heavy-duty midget relay — type 105

This "mighty midget" is often used on jobs normally requiring heavier-duty relays. Certain types are approved by Underwriters as motor controllers. Unique spring suspension adds a self-cleaning action to the heavy silver-to-silver contacts.

Single pole—double pole. AC or DC. BULLETIN 105.

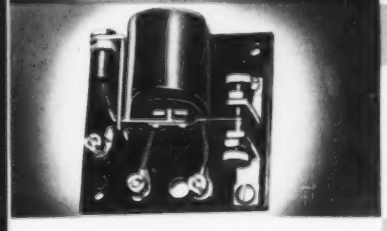


midget metal-base relay — type 104

A small compact relay that can be used in a wide variety of light-duty applications where space is limited. Two mounting types, front- and rear-mounted, for standard duty. Mounting frames are metal base and are insulated from the contact circuit. Contact fingers are flexible spring material to resist vibration.

Rear-mounted relays have tapped bosses fitted to the metal base frame, considerably reducing overall dimensions.

Double pole, double throw. AC or DC. BULLETIN 104.



sensitive relays — type 250

For use where devices or equipments are to be controlled by relays capable of operating on low power.

Large knurled heads and hexagon nuts facilitate the adjustment of silver contacts and the tension on the armature.

Good contact torque at pick-up with crisp drop out. AC or DC. BULLETIN 250.

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Ward Leonard VITROHM Resistors maintain consistent accuracy and stability under even the most unfavorable operating conditions.

If the resistors in your equipment will be subjected to thermal shock, vibration, corrosive atmospheres, overloads, even prolonged exposure to humidity and electrolysis . . . select VITROHM and benefit from these Ward Leonard exclusives—

(1) All components balanced in respect to thermal coefficient of expansion—hence, no loosening, no failure due to *unbalance.**

(2) Special Ward Leonard-made ceramic core possesses high density, low porosity and high dielectric.

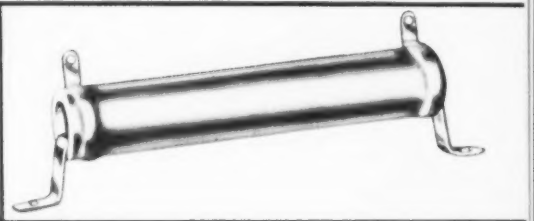
(3) VITROHM vitreous enamel coating provides a complete hermetic seal, is hard, crazeless, yet extremely elastic, and an excellent conductor of heat.

From the complete line of Ward Leonard resistors, including those described below, select the type best fitting your needs and enjoy the confidence of knowing your product is more dependable because the *resistor* component is more dependable.

**Ward Leonard is the only manufacturer who makes (not just assembles) all the components of a resistor. (Wire drawn to Ward Leonard specifications.)*

fixed resistors

WATTS: 5, 10, 20, 25, 50, 100, 160, 200
OHMS: 1 to 150,000
SIZES: $1\frac{3}{4}$ x $\frac{9}{16}$ in. to $10\frac{1}{2}$ x $1\frac{1}{8}$ in.

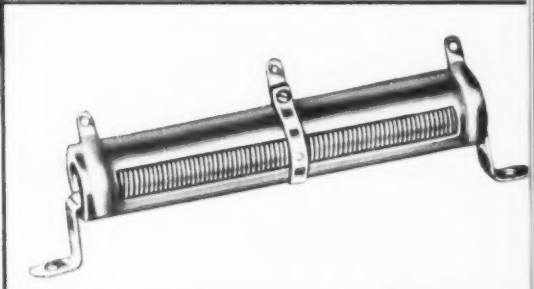


adjustable resistors ADJUSTOHM

The combination of high-quality wire, exclusive VITROHM enamel and Ward Leonard's extra care in manufacturing pays off particularly well in the case of adjustable resistors (which would otherwise be more susceptible to corrosion and damage). Wire turns are uniformly spaced and securely anchored. Contact points are rounded to make positive contact and yet avoid wire abrasion.

The ADJUSTOHM line comes in a complete range of resistance values and watt ratings.

WATTS: 10, 25, 50, 80, 100, 160, 200
OHMS: 1 to 150,000
SIZES: $1\frac{3}{4}$ x $\frac{9}{16}$ in. to $10\frac{1}{2}$ x $1\frac{1}{8}$ in.



strip resistors STRIPOHM

For applications where space is limited, STRIPOHM gives high unit space rating and extra strength. Elliptical shape increases strength. It also insures even and uniform winding because—with no sharp corners—the wire *hugs* the core shape. Greater surface area aids heat dissipation.

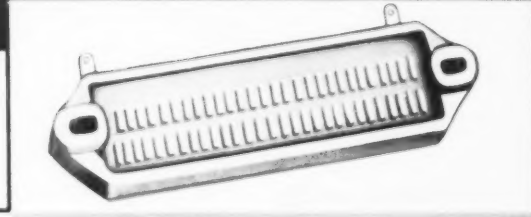
Combination of low mounting brackets and the arrangement of terminals facilitates multiple stacking.

WATTS: 30, 40, 55, 65, 75
OHMS: 0 to 66,000
SIZES: $1\frac{1}{4}$ to 6 in. lengths

placque resistors

For use where very low values of inductance and distributed capacitance are required. Wire of low temperature coefficient of resistivity is arranged on a rectangular refractory plate and completely imbedded in VITROHM enamel.

WATTS: 20, 40, 125
OHMS: 0 to 33,000
SIZES: $3\frac{1}{16}$, $4\frac{3}{8}$, $5\frac{3}{4}$ in. lengths



write for RESISTOR CATALOG

and tell us what types of resistors you use. Address WARD LEONARD ELECTRIC COMPANY, 21 South Street, Mount Vernon, N. Y. Offices in principal cities of U. S. and Canada.

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Result-Engineered Controls

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- Our vast stock of dies can save you special die costs.
- Our 70,000 square feet of modern plant, with hundreds of craftsmen, means ample capacity for many types of work—simple or elaborate—at one time.
- Plant is fully equipped with every mechanical facility that aids economical production.
- Finishing is done in dustproof paint shop, with latest water-washed spray booths and gas-fired ovens mechanically and electronically controlled.
- We make no stock items or products of our own. Our plant, time and effort are 100% for our *customers'* work.
- Our engineering staff can help solve any possible design and production problems.
- It's results that count—and we give you the results you want.

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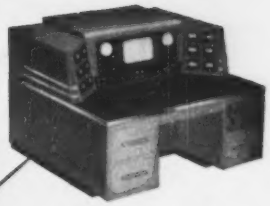
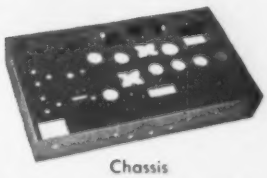


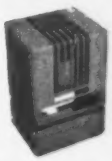
TV Monitor Console

Desk Panel Cabinet Rack

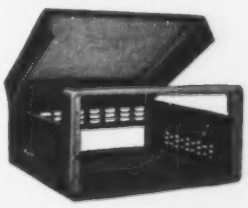
Induction Heater Housing



Chassis



Marine Radio Housing



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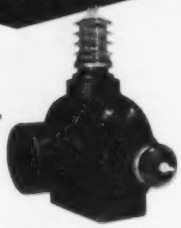

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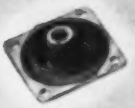
How LORD MOUNTINGS improve product performance



MULTIPLANE MOUNTINGS—

isolate vibration from all directions. Light in weight, small in size, they are widely used to mount electronic units.

Vibration Control Increases Sales—

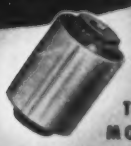
Equipment purchasers appreciate smooth performance . . . they like the "feel" of effortless power which makes any product easier to use—more comfortable to live with. Vibration Control puts a star salesman in every demonstration—with every buyer.

Vibration Control Reduces Operating Costs—

Gears and bearings last longer when protected from high vibratory stresses. Instruments and controls require less maintenance and fewer replacements . . . are more accurate and dependable.

Vibration Control Increases Efficiency—

Worker fatigue is reduced, resulting in more production and greater accuracy. Constant vibratory disturbance prevents full efficiency from both men and machines. Vibration Control improves working conditions and boosts production.



TUBE FORM MOUNTINGS—

Standard—for steady vibration and severe shock. Have great radial stability. Loads from ½ to several thousand pounds.

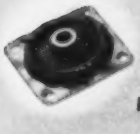


PLATE FORM MOUNTINGS—

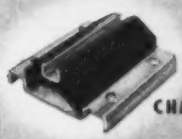
Standard—isolate steady vibration. Stable, compact—easily installed. Loads ½ to 120 pounds per mount.

TUBE FORM VERTICAL SNUBBING MOUNTINGS—

isolate steady vibration . . . cushion shock. Good for mobile equipment.

PLATE FORM VERTICAL SNUBBING MOUNTINGS—

isolate steady vibration plus severe shock. Loads up to 610 pounds per mount.

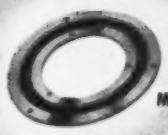


CHAN-L-MOUNTS—

Ready to use—easy to install. Isolate steady vibration and occasional shock. Extremely soft and sturdy, they give superior isolation.

F.H.P. FLEXIBLE COUPLINGS—

have exceptional torsional flexibility . . . accommodate parallel and angular misalignment. Ratings from 1 fiftieth to 1 hp.



METER MOUNTINGS—

protect small meters and instruments from destructive vibration. One piece construction, easily installed . . . many sizes for most commonly used models.

SHOCKMOUNTS—

absorb shock energy emanating from punch presses, looms, printing presses, etc. Neoprene is bonded to 3/16" steel. Load ratings up to 7500 pounds per mount.

M.H.P. FLEXIBLE COUPLINGS—

deflect under torsional load . . . isolate torsional vibration. Removable flexing elements allow couplings to be installed without moving shaft. Ratings up to 100 hp 1750 RPM.

LORD BONDED RUBBER

LORD Flexible Couplings accommodate shaft misalignment . . . dampen shock of sudden speed changes . . . protect motors.

LORD Bonded-Rubber Parts solve some of industry's toughest design problems. Valve seats, motor mounts, idler wheels, diaphragms, pipe adapters, torsion joints, bearing seals, are a few of the successful applications which have been made and are suggestive of opportunities for improvement of other products.

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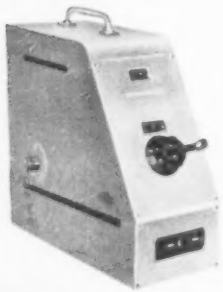
PRD takes pleasure in presenting a full summary of its test equipment for the entire spectrum from 10 to 40,000 megacycles per second. Each instrument embodies intelligently planned features designed to provide versatility of application with maximum accuracy and dependability over the broadest possible band. In addition, a skilled staff of engineers is available to analyze your requirements and to assist in the application of standard or special components to your test equipment problems. Where accuracy is essential it's good business to specify PRD.

Type 904
VHF-UHF NOISE GENERATOR
10-1000 mc/s

Type 901 UHF SWEEP FREQUENCY OSCILLATOR
470-890 mc/s



Type 584 UHF FREQUENCY METER
470-950 mc/s

COAXIAL COMPONENTS

ITEM	TRANSMISSION LINE SIZES (Nominal od-Inches)			
	7/8	3/8	1/2	5/8
Slotted Sections[4]	200-C 200-D	206-A 206-B	208-A 208-B	205-A 215-A
Attenuators:				
Uncalibrated				198
Piston				181
Fixed	136 Series			130 Series 135 Series
Terminations	113			102 123-7
Matching Transformers				206
Coaxial Transitions	389 390 391 392	364 395		389 390 391 392 364
Tube Mounts				701 -5, -4
Frequency Meters:				
Precision				560 583
Search				562
Reference Cavity				561-A
Detector Mounts:				612-A[1]
Crystal Mount				613
Bolometer Mount				612-A[1]

BOLOMETERS

1 The Type 610-A is supplied with the Types 250-A and 612-A.
2 The Type 614 is supplied with the Types 210, 211, 616 and 621.
3 The Type 617 is supplied with the Types 212, 618 and 620.

Broadband Probe

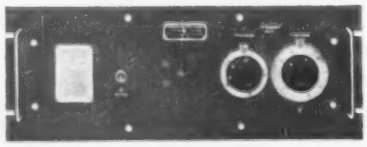
4 The Type 250-A Probe is designed for use with the Types 200-C through 209-A and Type 215-A. Precision Slotted Sections. Types 210-212 are supplied with Built-in Probes and Tuners and Replaceable Detectors.

Types 130, 135 FIXED COAXIAL PADS
2.00-10.0 kmc/s

Type 250-A BROADBAND PROBE
1.00-12.4 kmc/s

Type 205-A COAXIAL SLOTTED SECTION
4.00-10.0 kmc/s

Type 560 PRECISION FREQUENCY METER
2.40-3.40 kmc/s



Type 705 BROADBAND MICROWAVE OSCILLATOR
7.00-11.0 kmc/s

Type 612-A TUNABLE CRYSTAL AND BOLOMETER MOUNT
1.00-10.0 kmc/s

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Complete information and data concerning the entire PRD line of precision test equipment is contained in our new catalog. A request on your company letterhead will bring your copy promptly—address Dept. F-1.

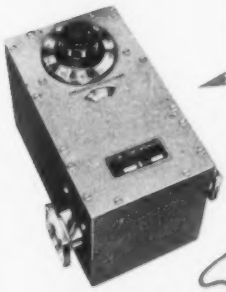
Polytechnic RESEARCH & DEVELOPMENT COMPANY, INC.

from VHF to SHF

by PRD

Type 169 CALIBRATED VARIABLE ATTENUATOR
3.95-5.85 kmc/s

Type 312 E/H TUNER
26.5-40.0 kmc/s



Type 559-A PRECISION FREQUENCY METER
8.20-10.0 kmc/s

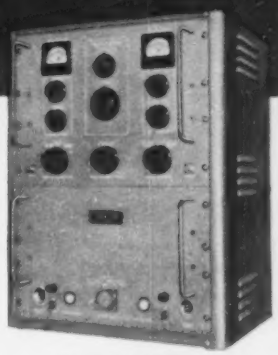
Type 616 TUNABLE CRYSTAL and BOLOMETER MOUNT
12.4-18.0 kmc/s

WAVEGUIDE COMPONENTS

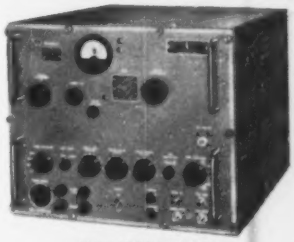
ITEM	WAVEGUIDE SIZE (INCHES)								
	3x1½	2.290x 1.145 I.D.	2x1	1½x¾	1¼x⅝	1x½	0.622x 0.311 I.D.	0.420x 0.170 I.D.	0.280x 0.140 I.D.
Slotted Sections[4]	209-A	207-S	201-A	204-A	202-A	203-A	210[2]	211[2]	212[3]
Attenuators:									
Flap	171		162	161	160	159	189	190	191
Uncalibrated	173-A	164-S	168-A	176-A	183-A	154 197-A	186-A		
Dial	174		169	177	184	196	187		
Precision	175	163-S	170	178	185	195	188	153-A	192
Piston						180			
Fixed	137 Series		120 Series	119 Series	118 Series	140 Series	138 Series		
Terminations	139	138-S	119	121	141	116	131	132	133
Directional Couplers			400	404	401	402	405		
Matching Transformers	309	307-S	300	305	302	303	311 314	313	312
Tube Mounts			704		702	703			
Frequency Meters: Micrometer Drive					551-G 551-H	551-E 551-F			
			574	575	576				
Precision		553-S	554-A 554-B	555-A 555-B 556-A 556-B	557-A 557-B 558-A 558-B	559-A 559-B 565-A 565-B	566-A 566-B 567-A 567-B	568-A 568-B 569-A 569-B	570-A 570-B 571-A 571-B
Detector Mounts: Crystal Mount						601	616[2]	621[2]	615
Bolometer Mount							614[1]	620[3], 1[2]	618[3]
Thermistor Mount						611			

ACCESSORIES

Waveguide to Coaxial Adapters	365		357	356	355	354			
Adjustable Waveguide Shorts							320	321	322
Bends E—Plane			450	454	458	462	466	470	474
H—Plane			451	455	459	463	467	471	475
Tees Series			452	456	460	464	468	472	476
Shunt			453	457	461	465	469	473	477
E/H Tees			478	479	480	481	482	483	484
Waveguide Stands	375		376	377	378	379	386	387	388
Flange Bolt and Nut Assemblies	369-A		369-B	369-B	369-C	369-D	369-E		

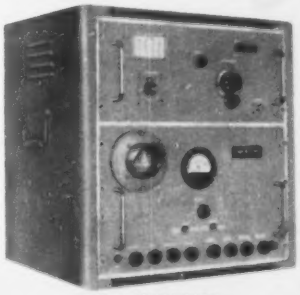


Type 801 UNIVERSAL KLYSTRON POWER SUPPLY
800-1500 V at 65 ma;
1.5-3.6 KV at 25 ma



Types 902 and 903 BROADBAND MICROWAVE SIGNAL GENERATORS
3.65-7.30 and 6.80-10.9 kmc/s

Type 650 UNIVERSAL POWER BRIDGE
0.1, 1.0, 10, 100 mw full scale



Type 850 SERIES UNIVERSAL SPECTRUM ANALYZERS
2.40-3.40 and 8.50-9.60 kmc/s

PRD Special Services for—

MICROWAVE SPECTROSCOPY COMPONENTS
PRD's spectroscopy coverage includes a full complement of precision frequency meters and attenuators, terminations, standing wave detectors, etc. Also available on special order are Stark cells and modulators as well as a complete line of 5mm equipment.

PRODUCTION TEST SYSTEMS
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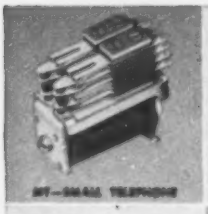
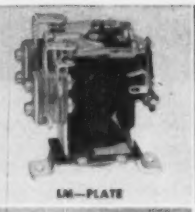


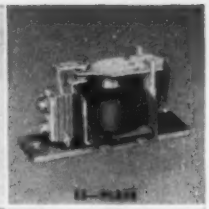
MT—SMALL TELEPHONE

ST—TELEPHONE

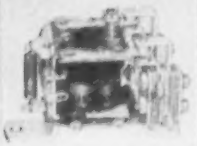
LT—LARGE TELEPHONE



LM—PLATE

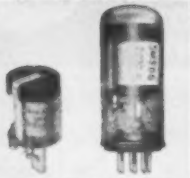


LL—PLATE

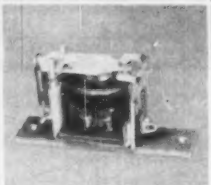


MR—MEDIUM POWER

MS—MOTOR START

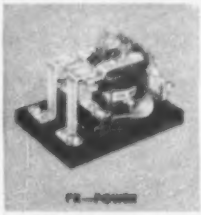


SM—SUPER MIDGET



LC—PLATE

LP—PLATE

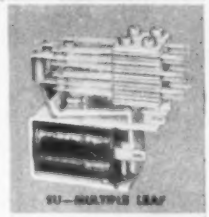


PR—POWER

Potter & Brumfield

Standard and Special Relays to meet any Specification

P & B Series	Max. Contact Arrangement	Coil Operation	Height	Width	Length
PR	2 form C	AC-DC	2 5/16	2 1/2	3 1/2
LM	2 form C	DC	2 3/8	1 3/8	2 1/4
SU	4 form C	AC-DC	2 3/8	1 7/16	2 1/2
EL	4 form C	AC-DC	2 3/8	1 3/4	3 11/16
LC	1 form C	DC	1 5/16	1 3/8	2 5/16
MR	2 form C	AC-DC	1 5/8	1 1/2	2 15/16
FR	2 form C	AC-DC	1 5/8	1 1/2	2 15/16
LS	1 form C	DC	1 3/8	1 3/8	2 5/8
LP	1 form C	DC	1 3/8	1 1/2	2 5/16
MS	1 form B	AC	1 13/16	2 5/16	2 1/4
KL	4 form C	AC-DC	1 15/16	1 5/16	1 3/8
MG	2 form C	AC-DC	X	2 1/16	2 1/4
SM	1 form C	DC	5/8	Diam.	1 5/16
KR	2 form C	AC-DC	1 1/4	1 5/16	1 11/16
SP	2 form C	AC-DC	1 5/8	1 1/2	2 5/8
ST	12 springs single stack	DC	2 1/16	1 11/32	2 21/32
LT	24 springs Dual Stack	DC	1 13/16	1 7/32	4"
MT	12 springs Dual Stack	AC-DC	1 7/32	11/16	1 1/2
CA	1 Form X SPSTNO-DB	AC-DC	1 1/2	1 3/8	2 5/16
Enclosure for LT only		Dust cover only	4 1/4	1 27/32	2 5/32
Enclosure for MT only		Hermetically Sealed	2 5/32	1	1 11/16
Enclosure for MT or KR		Sealed	2	1 13/32	1 5/8 Octal
Enclosure for MT or KR		Sealed	2	1 13/32	1 5/8 Solder

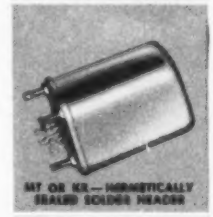


SU—MULTIPLE LEAF

KL—LIGHT DUTY

MT OR KR—HERMETICALLY SEALED OCTAL PLUG

KR—LIGHT DUTY



MT OR KR—HERMETICALLY SEALED SOLDER HEADER

CONTACT ARRANGEMENT FORMS

Auxiliary holding contacts can be supplied on several types on special order.

Additional insulation to comply with Underwriters recommendations on special order.

Send us your specifications for recommendations and quotations. Write for master catalog fully illustrating and describing all series and models. Your electronic parts distributor stocks P & B standard relays.

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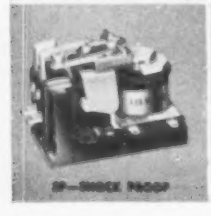
Engineering sales offices in principal cities. Export: 2020 Engineering Building, Chicago 6, Illinois

MG—MERCURY CONTACT

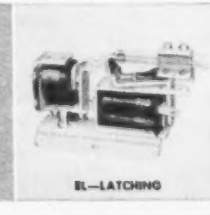
MT—HERMETICALLY SEALED



SP—SHOCK PROOF

PR—PHOTO FLASH

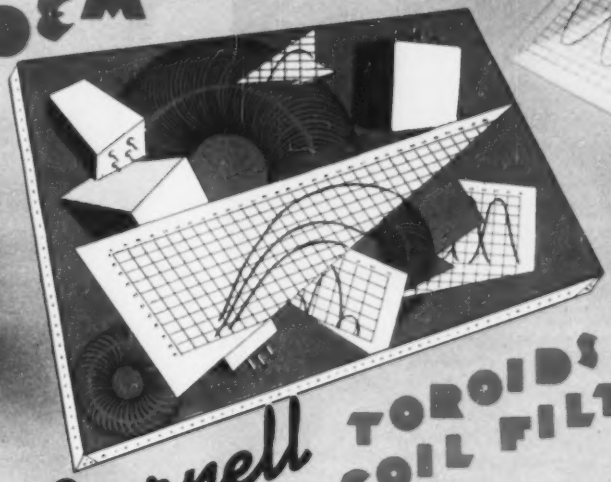
CA—SPACE SAVER

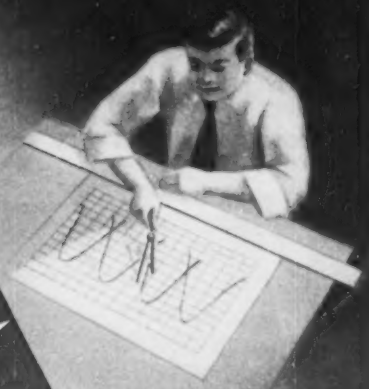


EL—LATCHING

LT—DUST COVER

MODERN APPLICATION DEMANDS . . .





Burnell TOROIDS & TOROIDAL COIL FILTERS

We know only too well what is modern today in Electronics can be obsolete tomorrow. We can retard obsolescence by designing our products with an eye toward the future and what future applications may demand of our products.

Burnell & Company has shaped its engineering policy with this viewpoint – by striving to keep well ahead – not just abreast of developments in the Hi Q Coil and Filter business.

We search constantly for new design ideas that will permit the reduction of size and weight of filters that "fly"; new circuits and components that will give our customers "more for their money" – and new production methods that will speed output and guarantee the reliability and life of our products.

Even our price structure has been streamlined to conform with the increasing industry-wide demand for economy, with no sacrifice in our high standard of quality.

We say that modern applications demand Burnell & Company's toroids and toroidal filter products because we are modern in every sense of the word: modern in outlook and technique as well as in price.

Exclusive Manufacturers of Communications Network Components

We particularly invite your inquiries concerning difficult filter applications

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RADIATION COUNTING
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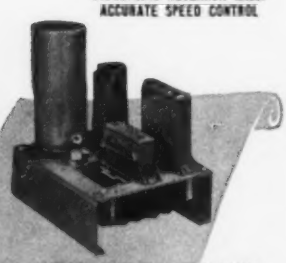
The controlling unit of these frequency standards is a bi-metallic fork, temperature-compensated and hermetically sealed against humidity and variations in barometric pressure. When combined with related equipment, accurate speed and time controls are afforded by mechanical, electrical, acoustical or optical means.

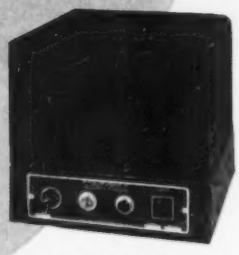
Instruments of our manufacture are used extensively by industry and government departments on such precision work as bomb sights and fire control.

Whatever your frequency problems may be, our engineers are ready to cooperate.

When requesting further details, please specify the Type Numbers on which information is desired.



TYPE 2001-2. BASIC UNIT
Frequencies, 200 to 1500 cycles. Dividers and Multipliers available for lower and higher frequencies. Miniaturized and JAN construction. Output, 6 volts.



TYPE 2005. UTILITY UNIT
consists of Type 2001-2 and booster to provide 10 watts at 110 V at 60 cyc. Input, 50-100 cyc.

TYPE 2121A. LAB. STANDARD
Outputs, 60 cycle, 0-110 Volts. 120-240 cycle impulses. Input, 50-400 cycles, 45 W.

TYPE 2111. POWER UNIT
50 W output, 0-110 V at 60 cyc. Input, 50-100 cyc., 275 W.

American Time Products, Inc.

580 Fifth Avenue *New York 19, N. Y.*

OPERATING UNDER PATENTS OF THE WESTERN ELECTRIC COMPANY

Be Sure of the RIGHT Motor Right from the Start

Bendix builds to Your Blueprints!

Tired of compromising your plans to fit standard "off-the-shelf" motors? Bendix will build to *your* requirements promptly and at moderate cost. Bendix manufactures fractional horsepower DC motors to the usual military specifications for airborne and ground equipment, offering a wide variety of speed and torque characteristics. Continuous or intermittent operation to meet your exact performance and physical requirements is obtained by the use of proper windings in various frame sizes from 1⅝" to 3 7/16" diameter. Samples or production units of special motors are priced competitively. Your detailed requirements will receive the prompt attention of our engineering department.

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A Scramulated Frenostat!!?

"A Scramulated Frenostat?!!? Never heard of it—I'm just a P.A. But don't worry, we'll call Sun Radio, they'll know all about it. They have everything."

"Has to Meet JAN Specs?—That's easy. Sun Radio *specializes* in JAN spec components—those boys have been a big help on our government orders."

"Unichassis?—Oh, yes, I know that item—it's distributed exclusively by Sun Radio. Amazing how many manufacturers use Sun as their exclusive distributor. Guess that shows what a great job they do in serving the customer."

"In a Hurry?—No problem. Sun Radio uses full time expeditors whose only job is to get us rush orders like this in a minimum of time."

"Crystal Triode?—Uhmmm . . . let me see . . . oh, yes, the 'Sun Radio Monthly Mailer' for May described one in detail. We'll write and have them put you on their mailing list—best way I know to keep informed of new products and bargain items."

"For Our California Plant?—Hmph, that's easy for Sun, they've been shipping all over the world for years."

"Catalog?—Sure, they're compiling one right now. I'll have Sun Radio put you on their list to get this big, new catalog of industrial, university and laboratory electronic components, instruments and supplies. They say it'll be something really worth having, what with its new approach and logical presentation of the thousands upon thousands of electronic items now on the market."

"Sure, I'm Sold on the Outfit.—As radio parts suppliers they're tops—it's just like dealing with all the parts manufacturers rolled into one, friendly, efficient, compact organization. You know, it's no wonder Sun Radio does such a terrific job as a parts supplier—why they've been at it since 1922."

Sun Radio & Electronics Co., Inc., New York, has no branches or affiliates in any other city. This is our one and only address. This is the outfit which for 28 years has been famous for its service as a parts supplier to government, industry, universities, research labs, broadcasters. Call or write for information, quotes, literature. Write to get on our mailing list for the famous MONTHLY MAILER and that great new catalog we are preparing.

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"ASK YOUR JOBBER" MEANS ASK SUN RADIO

for critical audio requirements

Specify Stancor

The Stancor HF and WF series of high fidelity audio transformers are premium components around which the finest quality audio equipment may be designed. Check these features:

- √ **Extremely wide frequency range.**
- √ **Special coil design for low leakage reactance and intermodulation distortion.**
- √ **High permeability shielding for minimum inductive pickup.**
- √ **Precision hum-bucking construction on low level units.**
- √ **Balanced multiple line matching available.**
- √ **Units potted in durable cast cases.**

HF Series

These units have a wide frequency response of 20 to 20,000 cps with ±1 db. Correct design reduces harmonic and intermodulation distortion to a negligible amount. Balanced humbucking construction minimizes hum pickup. Stancor impregnation insures long life. Cases are finished in gray enamel and have four threaded holes at each end for flush mounting. Stud-type terminals are plainly marked for easy identification.

LOW IMPEDANCE TO GRID

PART NO.	APPLICATION	PRIMARY IMP./OHMS	SECONDARY IMP./OHMS	MAX. LEVEL	HUM-PICKUP REDUCTION¶	MTG. ‡	LIST PRICE
HF-20	Low Imp. Mic., Pickup, or Line to Grid	50, 125/150, 200, 250, 333, 500/600	60,000 overall, in two sections	15 db	−74 db	HF-1	**$24.50**
HF-20X	Low Imp. Mic., Pickup, or Line to Grid	50, 125/150, 200, 250, 333, 500/600	30,000	14 db	−92 db‡	HF-1	**31.25**
HF-22	Low Imp. Mic., Pickup, or Line to P.P. Grids	50, 125/150, 200, 250, 333, 500/600	120,000 overall, in two sections	15 db	−74 db	HF-1	**27.50**
HF-22X	Low Imp. Mic., Pickup, or Line to P.P. Grids	50, 125/150, 200, 250, 333, 500/600	80,000 overall, in two sections	14 db	−92 db‡	HF-1	**34.25**
INTERSTAGE							
HF-30	Sgl. P. to P.P. Grids. Split secondary	15,000	95,000 (Turn ratio 2.5:1 overall)	17 db	−50 db	HF-1	**23.50**
HF-31	Single Plate to P.P. Grids. Split pri. and sec.	15,000	135,000 (Turn ratio 3:1 overall)	14 db	−74 db	HF-1	**24.00**
HF-32	P.P. Plates to P.P. Grids. Split pri. and sec.	30,000 Plate to Plate	80,000 (Turn ratio 1.6:1 overall)	26 db	−50 db	HF-2	**30.50**
MIXING							
HF-40	Low Imp. Mixer, Mic., Pickup, or Line to Line	50, 125/150, 200, 250, 333, 500/600	50, 125/150, 200, 250, 333, 500/600	17 db	−74 db	HF-1	**24.50**
OUTPUT							
HF-65	P.P. 2A3's, 6L6's, etc. to Line or Voice Coil	3,000 or 5,000 Plate to Plate	1, 2, 2.5, 3, 7.5, 10, 15, 20, 30, 50, 125, 200, 250, 333 or 500	20 watts		HF-2	**27.50**
HF-67	P.P. 2A3's, 6L6's, etc. to Voice Coil	3,000 or 5,000 Plate to Plate	30, 20, 15, 10, 7.5, 5, 2.5, 1.2	20 watts		HF-2	**20.00**
HF-66	P.P. Par. 2A3's, 6A5G's, 300A's, 6A3's to Line or Voice Coil	1,500 or 2,500 Plate to Plate	500, 333, 250, 200, 125, 50, 30, 20, 15, 10, 7.5, 5, 2.5, 1.2	40 watts		HF-3	**49.50**

HF-1 Case: *Shpg. wt., 3.0 lbs. Height overall, 3¼". Base area, 2⅝" x 3⅛". Mtg. ctrs., 2⅛" x 2⅞".* HF-2 Case: *Shpg. wt., 7.5 lbs. Height overall, 4⅛". Base area, 3⅛" x 3⅝". Mtg. ctrs., 2⅝" x 3⅜".* HF-3 Case: *Shpg. wt., 15.0 lbs. Height overall, 4⅛". Base area, 4⅛" x 5⅜". Mtg. ctrs., 4⅝" x 5⅛".*

WF Series

These units are of the same outstanding quality as the HF Series above, and, with the exception of two units, have a frequency response of 30-20,000 cps within ±2 db. The WF-21 and WF-25 have a response within ±2 db from 50-20,000 cps and have multiple alloy shields for extremely low hum pickup. All WF units are cased in the WF-6 type cast case with phenolic terminal board and four tapped holes for flush mounting. Overall dimensions are 2" high with 1⅛"x1⅛" base area. Mounting centers are 1⅝"x1⅜". Shipping weight is 0.6 lbs.

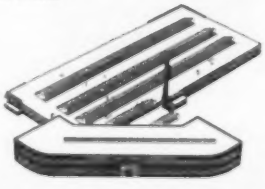
PART NO.	APPLICATION	PRIMARY IMP./OHMS	SECONDARY IMP./OHMS	LIST PRICE
INPUT				
WF-20	Low Imp. Mic., Pickup, or Line to Grid	50, 125/150, 200, 250, 333, 500/600	60,000	**$14.50**
WF-21	Low Imp. Mic., Pickup, or L. to Sgl. or P.P. Grids	50, 200, 500	60,000	**15.50**
WF-22	Low Imp. Mic., Pickup, or Line to P.P. Grids	50, 125/150, 200, 250, 333, 500/600	80,000 overall, in two sections	**14.50**
WF-24	Dynamic Microphone to 1 or 2 Grids	30	50,000 overall, in two sections	**14.00**
INTERSTAGE				
WF-26	Single Plate to Single Grid	15,000	60,000 (Turn ratio 2:1)	**12.75**
WF-28	Sgl. Pl. to 2 Grids. Can use split pri. for P.P. Pl.	15,000	80,000 overall (Turn ratio 2.3:1 overall)	**14.00**
LOW LEVEL OUTPUT				
WF-34	Single Plate to Line	15,000	50, 125/150, 200, 250, 333, 500/600	**14.50**
WF-36	P.P. Low Level Plates to Line	30,000 Plate to Plate	50, 125/150, 200, 250, 333, 500/600	**15.00**
WF-35	Single Plate to Multiple Line. Primary D.C. 8.0 ma. Response from 50-20,000 cps within ±2 db.	15,000	50, 125/150, 200, 250, 333, 500/600	**14.00**
MIXING				
WF-30	Low Imp. Mixer, Mic., Pickup, or Line to Line	50, 125/150, 200, 250, 333, 500/600	50, 125/150, 200, 250, 333, 500/600	**14.50**

‡Response ± 1 db from 25 to 20,000 cps. ¶As compared to standard uncased units. ‡Quadruple alloy magnetic shield.

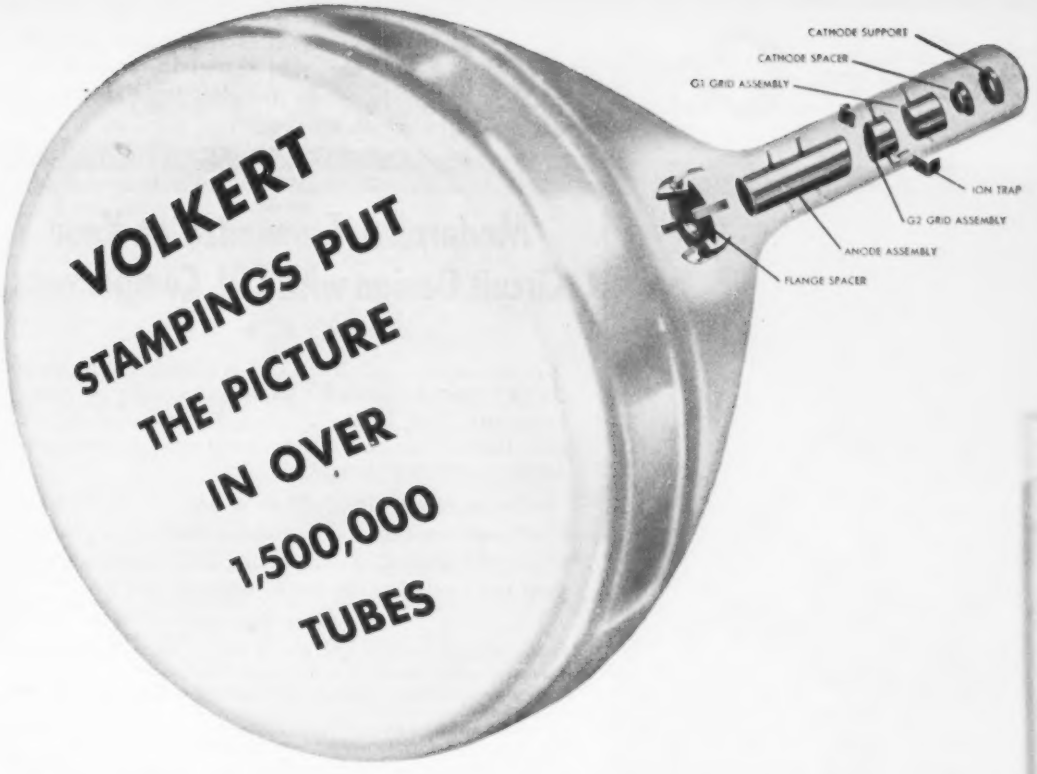
These units are representative of the more than 400 part numbers in the Stancor stock line—the most complete in the industry. They are available for immediate delivery from your local Stancor distributor. A catalog item will, in many cases, fill the special application.

In addition, a large part of Stancor's modern facilities are devoted to quantity production of made-to-specification transformers for the electronic industry. Your inquiries are invited.

Write for Stancor's 1950 Catalog today.



STANDARD TRANSFORMER CORPORATION, 3586 Elston Avenue, Chicago 18, Illinois



More than 35% of the metal parts in all electron guns are produced at Volkert—at the rate of 30,000 sets weekly! Here, engineers who pioneered with the industry in television tooling have redesigned the major metal components to help bring down the cost of tube assemblies. For example—

Grids are deep drawn in one operation; tubing formerly required many production steps— *cost saving*—58%

Flange spacer is produced in one piece instead of five parts welded together— *cost saving*—48%

Anode is made with a lock seam from flat strip instead of tubing— *cost saving*—53%

Volkert has designed and built high production dies and produced parts for cathode ray tubes since 1937—during the war for radar. That's why leading television design engineers find it profitable to consult with Volkert.

Volkert produced 138 million precision stampings in 1949 for radio and television on batteries of the latest-type equipment with automatic feeds. Through skilled inspection procedures all along the production line, Volkert is able to maintain the close tolerances required, yet manufacture such huge quantities of parts with only negligible rejects.

This combination is what Volkert brings to every precision stamping problem.

JOHN VOLKERT METAL STAMPINGS INC.
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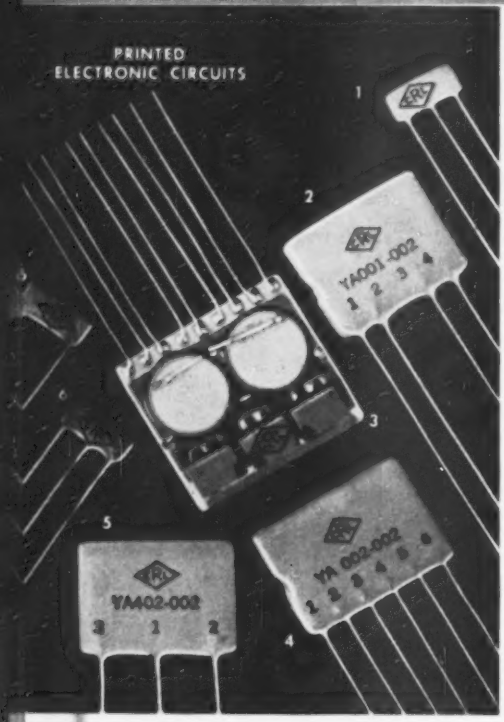
Volkert
PRECISION STAMPINGS

LOOK TO Centralab

First in component research that means lower costs for the electronic industry.



Modernize, Economize on Your Circuit Design with CRL Components

• • •

IN MINIATURE circuit design such as hearing aid amplifiers, CRL Printed Electronic Circuits are becoming increasingly popular. First, because of *compact size;* second, *dependable electrical characteristics;* third, *rugged construction;* and fourth, *resistance to humidity.*

Our engineers will gladly show you how P.E.C.'s can be adapted to your needs. Centralab is the *original producer* of printed electronic circuits — first to integrate all necessary parts and wiring into one simple miniature unit.

• • •

Illustration shows variety of CRL genuine electronic circuits now available.

1. Filpec — a tiny balanced diode load filter. Bulletin *42-9.*

2. Couplate — a complete printed triode interstage coupling plate. Bulletin *42-6* and *42-27.*

3. Model 2 Ampec — a printed circuit miniature, one-piece three stage amplifier. A complete circuit from input to output. Details on specific request.

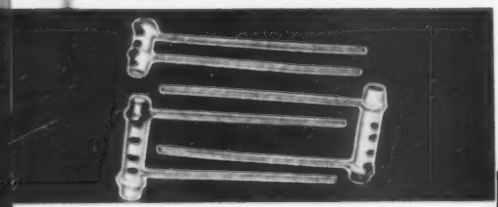
4. Pentode Couplate — a complete pentode interstage coupling circuit. Bulletin *999.*

5. Vertical Integrator — a vertical integrator printed circuit network, designed for TV application. Bulletin *42-22.*

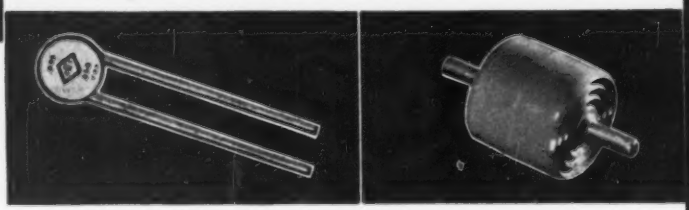
6. Ceramic Plate Components — single, multiple, capacitor, resistor and RC components, on a miniature ceramic plate. Bulletin *42-24.*

Use CRL Ceramic Capacitors for Television Applications

More and more TV set manufacturers are including CRL's advanced line of TC and BC *Hi-Kaps, Disc* and *Hi-Vo-Kap* capacitors in their latest circuit designs. *Reason:* CRL capacitors are made with Centralab's *exclusively* developed Ceramic-X material; afford consistent electrical characteristics, mechanical durability, increased longevity and are impervious to moisture.



CRL Tubular Capacitors. Negative temperature coefficient *TC Hi-Kaps* are ideally suited to prevent frequency drift in resonant circuits, TV, FM and AM tuners. Also readily adaptable to HF circuits as coupling and blocking condensers where low loss, stable capacity is required. No appreciable change with aging, humidity or temperature — four sizes, capacity from .5 to 2400 mmf., rated at 500 WVDC. *BC Hi-Kaps,* for use where temperature compensation is unimportant. From .000010 to .01 mfd., 500 WVDC. Send for Bulletin 42-3.



CRL *Disc* Capacitors. The miniature, ceramic *Hi-Kap* disc capacitor, designed for low inductance, low effective resistance at VHF, the best R.F. bypass condenser for TV and FM. Reliability in small size and low weight. Bulletin 42-4.

CRL *Hi-Vo-Kaps.* Principle use — TV video, high voltage power supply. High voltage pulse filter requirement for cathode ray tubes. Also, transmitter low power DC filter. Low power, high voltage power supplies. Bulletin 42-10.

Centralab Capacitors for other Applications

High Accuracy — for rigid frequency control. Capacity tolerance, ± 1%. TC tolerance ± 10 ppm over temperature range: — 30 to + 85° C. Standard working voltage, 500 D.C.

High Voltage—capacity tolerance, ± 10%. Five sizes, from 5000 to 15,000 WVDC. Flashover voltage — 10,000 to 30,000 VDC. Current ratings: 1.5 amps to 15 amps, RMS at 30 MC. Write for information. **Trimmers:** Four basic types. WV, 500 DC. Flash test 1100 VDC. Power factor, less 0.2% at 1 megacycle. Write for information.

BUY FROM Centralab

Makers of a complete line of components for the electronic industry.

SWITCHES . . . complete line featuring high quality, rugged construction for every type of electronic and industrial application.

Spring Return Rotary Switch: made with coil spring and cam index. 30 degree index, with 10 indexing combinations, permits handling up to three sections. Tested stop-strength of 48 inch pounds. (RMA Standard, 24 inch-pounds). Guaranteed minimum life, 100,000 cycles. (RMA Standard, 10,000 Cycles). Removable coil spring — can be replaced without removing switch from chassis. Bulletin No. 995.

"F" Index: for simple band change or radio-phono operations or general switching applications. V-spring. Life test — 5 positions — 10,000 cycles.

"G" Index: ideal for industrial applications. Coil spring replaceable without removing switch. Life test — 5 positions — 250,000 cycles.

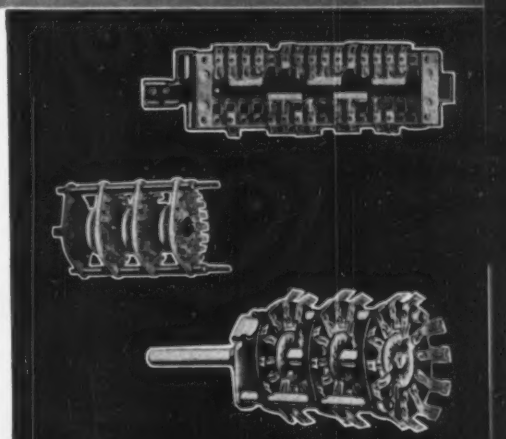
"H" Index: (at right) primarily for band change and general tap switch applications. Spring and ball mechanism. Life test—5 positions—10,000 cycles.

Tone Switch: 3-4-6-8-9 or 10 clips available in tone switch group. All rated at 6 watts. Contact resistance less than 2¾ milliohms.

Lever Switch: eight basic indexing combinations available. Exclusive coil spring design with cam and roller offers truly long life, (guaranteed minimum life test of 100,000 cycles), and low capacity for all circuit work such as test, inter-com, AF and RF equipment. Bulletin 970.

Power Switch: designed for transmitters, power supply convertors, X-ray equipment, etc. Efficient performance up to 20 megacycles.

For complete details ask for Switch Catalog 722.



CONTROLS . . . low noise level, long life, dependable performance, wide range of possible variations.

Model 1 Radiohm: smaller than a dime, for miniature receivers, amplifiers. Rating — 1/10 watt. Shielded from dust, lint, etc. Bulletin 42-7.

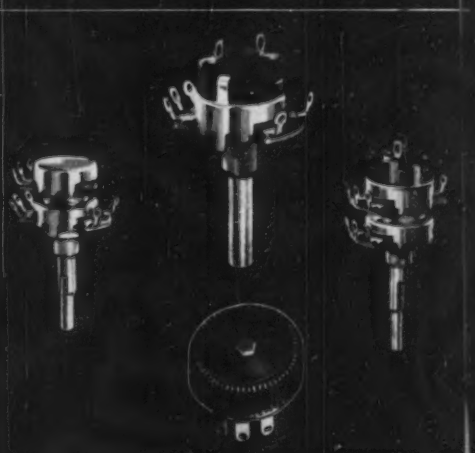
Model 2 Radiohm: A fine *new* precision line of controls for AM — FM — TV. 15/16" dia. rated at ½ watt. Variety of unit types available — 3 basic switches 1, 3, and 8 amp. Bulletin #42-85.

Model "R" Radiohm: Wire wound rated at 3 watts. Available with AC line switch.

Model "M" Radiohm: Most versatile control of all. Composition type. Rated at ½ watt. Can be twinned, tripled — twinned with switch or with concentric shaft.

Switch Covers: Five types for "R" Radiohms; four types for "M" Radiohm; Rated at 3 amp. 125 volts, 1 amp. 250 volts.

Rheostats: For commercial use such as small motor speed controls, charging rate adjusters, etc. Two sizes available: 25 and 50 watts.



CERAMICS . . . engineered for special industrial and electrical applications requiring specific properties of hardness, coefficient of expansion, porosity. Bulletin 720.

Steatite: Uniform white, high dielectric strength, high mechanical strength, low dielectric loss at high frequencies. Impervious to moisture and common acids, won't warp in use, withstands high temperature, remains stable.

Centradite: For use where low thermal expansion and high resistance to heat shock is desired. Composed chiefly of Cordierite, a magnesium aluminum silicate crystalline material. White in color and low in porosity. Variations available for specific design and production needs.

Zirconite: Low coefficient of expansion. Good thermal shock properties. High strength characteristics. Recommended for extruded or wet-pressed shapes. Variations also available to meet specific needs. Send for information.

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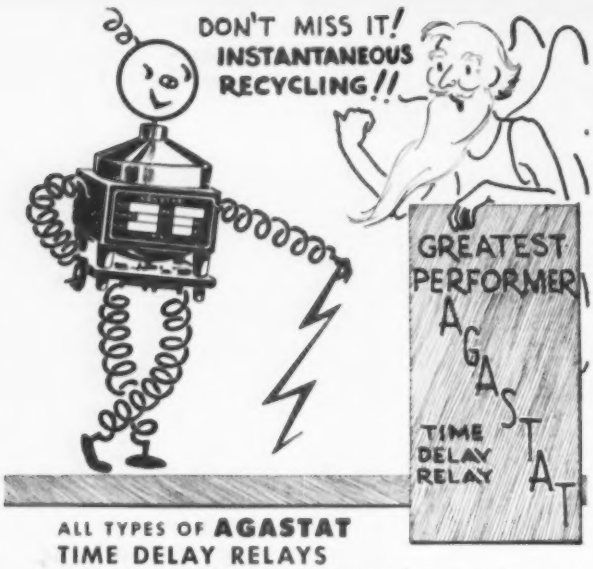

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recycle instantly! In the type 1 the delay starts when the control circuit is closed; in the type 2 it starts when the control circuit is open.

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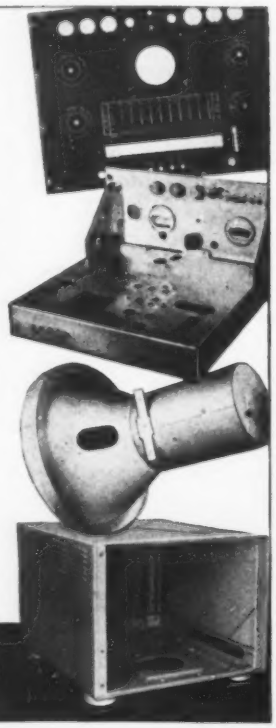

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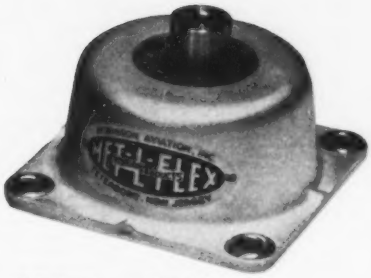
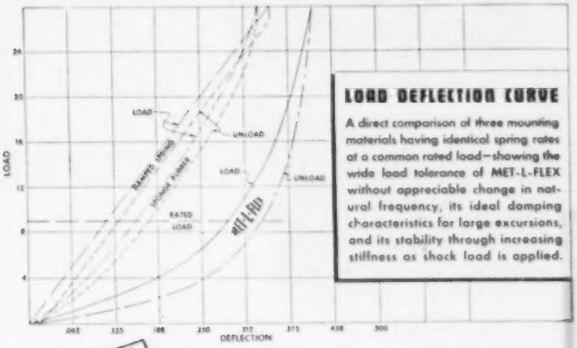
ROBINSON VIBRATION AND SHOCK MOUNTS

With MET-L-FLEX



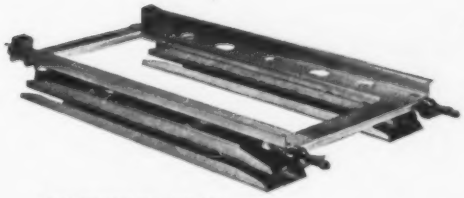
Unit Mounts—cup type and plate type unit mounts in sizes and load ratings to meet every requirement.



LOAD DEFLECTION CURVE

A direct comparison of three mounting materials having identical spring rates at a common rated load—showing the wide load tolerance of MET-L-FLEX without appreciable change in natural frequency, its ideal damping characteristics for large excursions, and its stability through increasing stiffness as shock load is applied.

CONSIDER THESE REMARKABLE ADVANTAGES



Dual Suspension Mounting Base—provides the ultimate in isolation efficiency. Available in JAN sizes, or special sizes to fit your equipment.

- **Uniformity under all temperature extremes** from −80°C to +175°C.
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- **Stability**—interwire friction reduces amplification at resonance and effects greater stability in the mounting system.
- **Wide load tolerance**—can be underloaded or overloaded as much as 50%.
- **Resistance to permanent set**—the drift rate, or permanent set, is negligible.

Dual Suspension Beam Assemblies—for shelf installations and other special equipment sizes.

Consult Robinson experienced vibration control engineers. Save on costly research and experimental installations.

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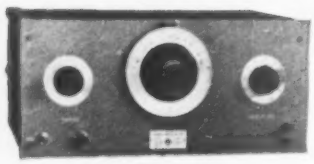
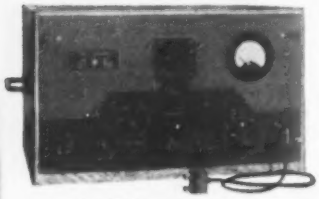
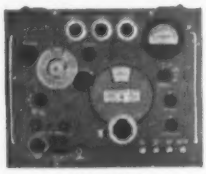


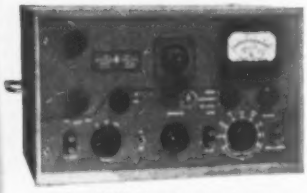
–hp– 200C Audio Oscillator



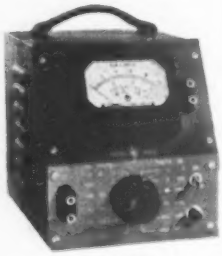
–hp– 650A Signal Generator



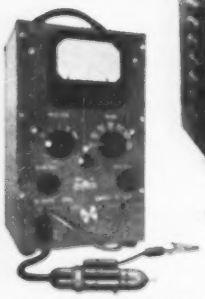
–hp– 616A
UHF Signal Generator



–hp– 330B Distortion Analyzer



–hp– 400C
Vacuum Tube Voltmeter



–hp– 410A Vacuum Tube Voltmeter

FUNCTION	MODEL	FREQUENCY	CHARACTERISTICS
SECONDARY FREQUENCY STANDARDS	100C	100 kc, 10 kc, 1 kc, 100 cps	Temperature controlled; accuracy 0.001%; sine wave output
	100D	100 kc, 10 kc, 1 kc, 100 cps, 10 cps	Temperature controlled; accuracy 0.0002%; sine, square wave output; time markers
RESISTANCE-TUNED OSCILLATORS	200A	35 to 35,000 cps	Output 1 watt into 500 ohms; 1% distortion
	200B	20 to 20,000 cps	Output 1 watt into 500 ohms; 1% distortion
	200C	20 to 200,000 cps	Output 10 volts into 1,000 ohms; 1% distortion
	200D	7 to 70,000 cps	Output 10 volts into 1,000 ohms; 1% distortion
	200H	60cps 600,000 cps	Output 10 mw into a 100 ohm load; 3% total distortion
	200 I	6 to 6,000 cps	Frequency setting closer than 1%; output 10 volts into 1,000 ohms; 1% distortion
	201B	20 to 20,000 cps	Output 3 watts at 1% and 1 watt at ½% distortion into 600 ohms
	202B	½ to 50,000 cps	For low frequency studies. Output 10 volts into 1,000 ohms; 1% distortion
	202D	2 to 70,000 cps	Output 10 volts into 1,000 ohms; 2% distortion
	204A	2 to 20,000 cps	Portable, battery-operated; output 5.0 volts to 10,000 ohm load; 1% distortion
AUDIO SIGNAL GENERATORS	205A	20 to 20,000 cps	Output 5 watts, 1% distortion into impedances of 50, 200, 600, 5,000 ohms. Output VTVM and 110 db attenuator, 1 db steps
	205AG	20 to 20,000 cps	Same as 205A, plus separate VTVM for complete gain measurements
	205AH	1 to 100 kc	Output 5 watts, 1% distortion into 50, 200, 500, 5,000 ohm impedances. Output VTVM and 110 db attenuator, 1 db steps
	206A	20 to 20,000 cps	Output +15 dbm with less than 0.1% distortion into 50, 150, 600 ohm impedances. Output VTVM and 111 db attenuator in 0.1 db steps
SQUARE WAVE GENERATOR	210A	20 to 10,000 cps	Output 50 volts peak to peak, 1,000 ohm internal impedance, 70 db attenuator, 5 db steps
PULSE GENERATOR	212A	50 to 5000 pps	50 volt pulse to 50 ohm load. Variable 0.07 to 10.0 microseconds
WAVE ANALYZER	300A	30 to 16,000 cps	Variable selectivity, measurement range 1 mv to 500 volts, 5% accuracy
DISTORTION ANALYZERS	320A	400 cps and 5 kc	Measures total distortion as low as 0.1%, 70 db attenuator, 1 db steps for comparison
	320B	50, 100, 400 cps and 1, 5 and 7.5 kc	Same as 320A
	330B	Any frequency 20 to 20,000 cps	Measures total distortion low as 0.1%. Input amplifier, complete VTVM, each usable separately
	330C	Any frequency 20 to 20,000 cps	Similar to 330B. Meter has VU characteristic to meet FCC requirements for FM broadcasting
	330D	Any frequency 20 to 20,000 cps	Similar to 330B, includes AM detector and VU meter characteristics. For FM and AM broadcasters
BROADCAST MONITORS	335B	88 to 108 mc	For FM broadcast. FCC approved. Monitors carrier frequency and modulation. High fidelity output for aural monitoring
	335C	54 to 88 mc	For TV aural monitoring, channels 2 to 6. Same as 335B
	335D	174 to 216 mc	For TV aural monitoring, channels 7 to 13. Same as 335B
	337A	30 to 175 mc	FM Communications Monitor, indicates mean frequency and modulation. Operates on 1 frequency
	337B	30 to 175 mc	Same as 337A. Any 4 frequencies
ATTENUATORS	350A	Max 100 kc	110 db, 1 db steps, 5 watts, 500 ohm level. Bridged T type. Accuracy 1 db in 50 db or 100 kc
	350B	Max 100 kc	Same as 350A but 600 ohm level
FILTERS	360A thru D	Cutoff A—700 cps B—1200 cps C—2200 cps D—4100 cps	Low pass, 50 db attenuation at 1.2 cutoff frequency, 50 ohms impedance

ELECTRONIC MEASURING INSTRUMENTS

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FUNCTION	MODEL	FREQUENCY	CHARACTERISTICS
VACUUM TUBE VOLTMETERS AMPLIFIERS, AND ACCESSORIES	400A	10 cps to 1 mc	Nine ranges 0.03 to 300 volts full scale. Accuracy ±3% to 100 kc, ±5% to 1 mc. Average reading. Calibrated in rms.
	400B	2 cps to 100 kc	Same as 400A with response flat to 2 cps. 10 megohm input impedance.
	400C	20 cps to 2 mc	Twelve ranges 0.001 to 300.0 volts full scale; accuracy ±3% to 100 kc, ±5% to 2 mc. 10 megohm input impedance. Average reading; calibrated in rms volts; may be used as 54 db amplifier.
	404A	2 to 50,000 cps	Portable, battery-operated. eleven ranges 0.003 to 300 volts full scale; accuracy ±3% to 20 kc. 10 megohm input impedance.
	410A	20 cps to 700 mc	AC: six ranges 1 to 300 volts. DC: seven ranges 1 to 1,000 volts. Resistance: seven ranges 0.2 ohm to 500 megohms.
	415A	300 to 2,000 cps	Standing Wave Indicator for use with a bolometer or crystal rectifier; standard frequency 1000 cps, others on special order.
	417A	10 to 500 mc	VHF Detector. Approximately 5 microvolts sensitivity.
	430A	Depends on Bolometer Mount	Microwave Power Meter. Measures directly power dissipated in a 200 ohm bolometer. Full scale reading 0.1 to 10.0 milliwatts.
	450A	10 to 1,000,000 cps	Amplifier. 40 db and 20 db stabilized gain. Input impedance 1 megohm.
	452A	25 cps to 20 mc	Capacitive voltage divider for Models 400A or C and 410A. Division ratio 1000:1.
	453A	10 kc to 100 mc	Capacitive voltage divider for Model 410A. Division ratio 100:1.
	454A	20 cps to 2 mc	Capacitive voltage divider for Models 400A, 400C. Division ratio 100:1.
	455A	to 1,000 mc	Connects probe of 410A across 50 ohm transmission line. Type N fittings.
	458A	to 1,000 mc	Connects probe of 410A to open end of 50 ohm transmission line. Type N fittings.
	459A	dc only	Resistive voltage multiplier for Model 410A dc section. Ratio 100:1.
	460A	100 kc to 140 mc	Amplifier. 20 db gain. Rise time .002s max. No overshoot. 200 ohm impedance level.
	470A	to 1 mc	Shunt resistor for 400A, B, C. 0.1 ohm.
	470B thru F	to 2 mc	Same as 470A. 1.0, 10, 100, 600 and 1000 ohms.
TUNABLE BOLOMETER MOUNTS	475A	300 to 1,000 mc	Matches 50 ohm line to Bolometer of 100-200 ohms.
	475B	1,000 to 4000 mc	Same as 475A.
ELECTRONIC FREQUENCY METER	500A	5 cps to 50 kc	Ten ranges. ±.2% accuracy. Input 0.5 to 200 volts.
ELECTRONIC TACHOMETER	505A	300 to 3,000,000 rpm	Ten ranges. ±.2% accuracy.
	505B	5 to 50,000 cps	Same as 505A except calibrated in rps.
SIGNAL GENERATORS	608A	10 to 500 mc	Calibrated output 0.1 ev to 1.0 v. Amplitude and pulse modulated. Direct frequency calibration.
	610B	450 to 1230 mc	Calibrated output 0.1 microvolt to 0.1 volt. Internal pulse modulation. Direct frequency calibration.
	614A	800 to 2100 mc	Calibrated output 0.1 microvolt to 0.2 volts. Internal pulse and FM modulation.
	616A	1,800 to 4,200 mc	Calibrated output 0.1 microvolt to 0.2 volts. Internal pulse and FM modulation.
	650A	10 cps to 10 mc	Direct reading. Six bands. Output 3 volts to 600 ohm load. VTVM and output attenuator.
POWER SUPPLIES	710A		Any dc voltage 180 to 360 for 0 to 75 ma load; approximately 1% regulation. Also 6.3 volts, 5 amps ac.
	712A		Zero to 800 -. Loads zero to 200 ma at ½% regulation. Also 150 +, negative and 6.3 v filament supplies.
VHF BRIDGE	803A	50 to 500 mc	Direct reading. Impedance 7 to 2,000 ohms. Phase angle —90° to 90°.
SLOTTED LINES	805A	500 to 4,000 mc	VSWR less than 1.04. Tunable probe. 50 ohm impedance. Type N connectors.
	805B	500 to 4000 mc	VSWR less than 1.02. Tunable probe. 46.3 impedance. For ½" rigid coaxial cable.

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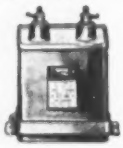
TYPE DYR Oil-filled "bath tub" capacitors. Provided with terminals either side, top or bottom. In all capacity combinations and voltages to 1000 V.D.C.

DYKANOL® TRANSMITTER CAPACITORS



TYPE T's are the finest, most dependable capacitors obtainable for broadcast and commercial transmitting application. In all popular capacities up to 7,500 V.D.C.

TYPE TQ DYKANOL® CAPACITORS. Hermetically sealed in round aluminum containers. With two insulated terminals available at voltages between 600 and 3,000 V.D.C.

TINY MIKE® CERAMICS

Miniature disc type—highly efficient, low cost. Remarkably rugged. Available in capacity range of 1,000 mmfd. to 5,000 mmfd. guaranteed minimum capacity, at 500 V.D.C.W. Units of between 100 and 150 mmfd. at ±20% or ±10%

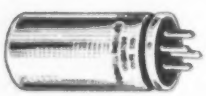
MICA RECEIVING AND TRANSMITTING CAPACITORS

MOULDED MICAS for all requirements. Available moulded in low loss bakelite. "Silver-Mike" micas for use in high Q electronic circuits.

TYPES 4 and 9—for amplifier and transmitter applications. All capacities in voltages to 5,000 V.D.C. test.

TYPE 30 Series Transmitter micas feature world famous series stack construction.

VIBRATORS



C.D. vibrators are quieter, longer lasting, more efficient.

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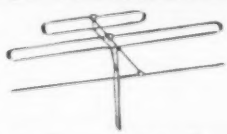
TV, AM, FM, AUTO and ROTATOR ANTENNAS



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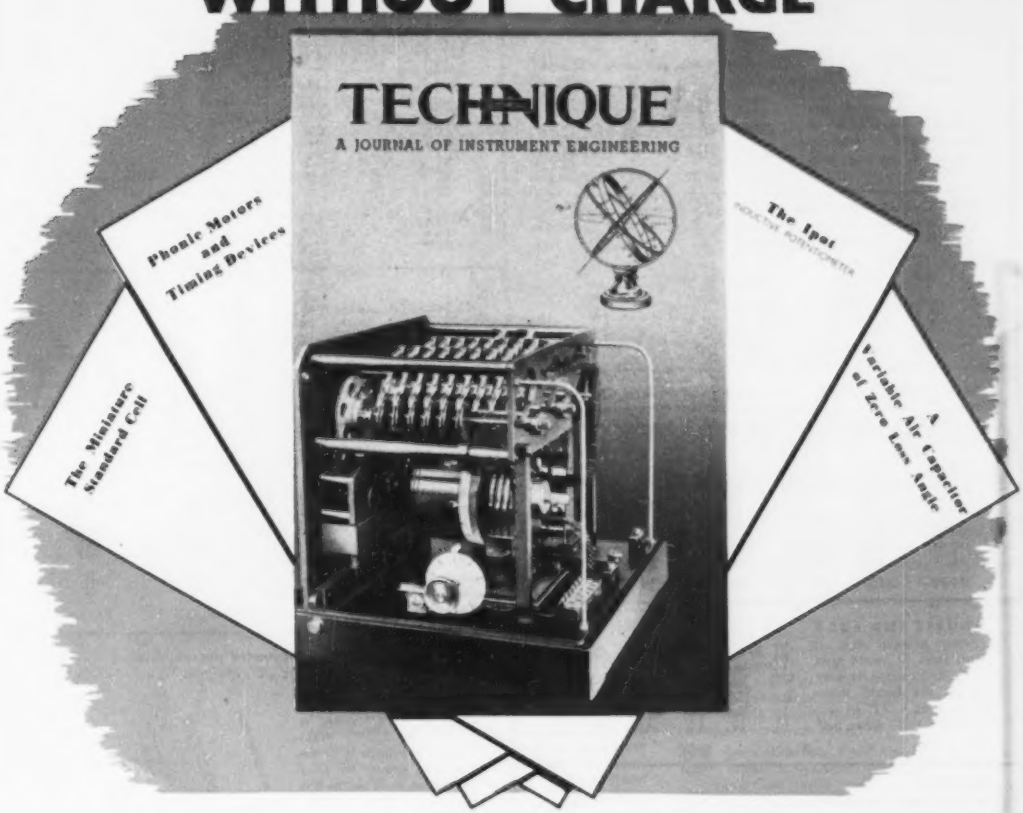
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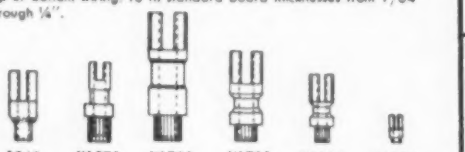
ELECTRICAL AND ELECTRONIC COMPONENTS AND HARDWARE

SHORT LUGS *(All Terminal Lugs shown actual size unless otherwise specified. All Lugs silver-plated brass.)*

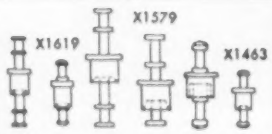
For low "headroom" applications. Available in shank lengths for 6 board thicknesses, starting with 1/64".

TURRET LUGS. With 2 soldering spaces for 2 or more connections. Stocked in 1/32", 1/16", 3/32", 1/8", 3/16", 1/4" sizes for standard phenolic terminal board thicknesses.

SPLIT LUGS (Knurled). For potted units where later soldering is advisable, as well as standard applications. Hole through shaft allows top or bottom wiring. To fit standard board thicknesses from 1/64" through 1/4".



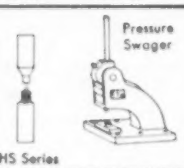
DOUBLE END LUGS
Provide terminal posts on both sides of board with through connection for easy wiring. For board thicknesses from 1/32" to 1/4". X1619 & 1620 shown half size.



SWAGERS

H. S. (Hand) Swagers are sold outright in sizes for any CTC Terminal Lug.

Pressure Swagers. Supplied with dies for one type terminal on loan basis. Extra dies or unit with dies may be bought outright.



NEW CERAMIC* UNITS

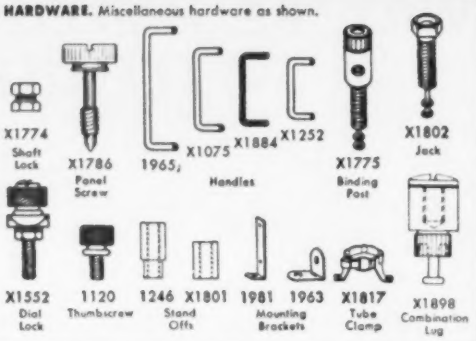
Insulated Terminals: X1942 is similar in size to phenolic unit X1581 (see above right). X1942Y is similar in size to phenolic unit X1580 (see above right).

Slug Tuned Coil Forms: LS6 is similar in size to phenolic unit LSM (see column at right). LS3 is similar in size to phenolic unit LS3 (see column at right).

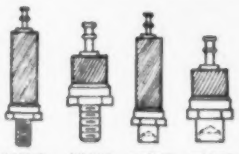
LST Coil Form: mounted height under 1/8". Form diameter 3/16". Ring terminals of brass, silver plated; mounting bushings of brass cadmium plated. Adjustable powdered iron slug. Furnished as coil form or wound to specifications with either single-layer or pie type winding.

*Grade L-5 ceramic, silicone impregnated.

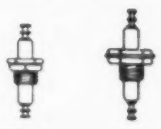
HARDWARE. Miscellaneous hardware as shown.



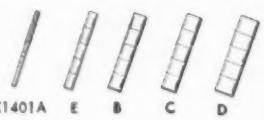
INSULATED TERMINALS
Two sizes in rivet or stud type, for high electrical stresses over broad humidity range. Phenolic insulator with X1558 Turret Lug. Voltage breakdown X1719, X1718, 11,000V at 60 cycles RMS. X1581, X1580, 6000V.



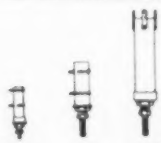
INSULATED FEED THROUGHS
Ruggedly constructed to withstand vibration and shock without loosening. Approved XXX phenolic insulating material. Brass bushings, nickel plated. Brass through-terminals, silver plated for easy soldering.



TERMINAL BOARDS. Of laminated phenolic. Using #1724 lugs, board available in 4 widths: 1/2", 2", 2 1/2" and 3", in 3/32", 1/8" and 3/16" thicknesses. Using X1558 lugs, 1 style available, 1 1/16" wide, in 1/16" or 3/32" thicknesses. All boards in 5-section units, scribed for easy separation. Each section has 10 lugs in 2 rows. (X1401A has 5 lugs, 1 row.)

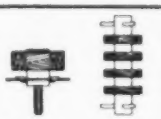


SLUG TUNED COILS. Miniature variable inductors. LSM 27/32" high, LS3 1 1/4" high when mounted. Both in 5 standard windings (1, 5, 10, 30, 60 mc) also special windings or ns high quality phenolic coil forms. Performance charts available. LS4 (coil form only) 2" high.



R. F. CHOKES. LHC — high Q iron core choke with 6-32 mounting stud, in 8 standard values from 2.5 mh to 125.0 mh.

LAB — Pie wound on phenolic core with cotter pin terminals in 8 windings from .75 mh to 15.0 mh. Current rating for both — 125 ma.



CUSTOM ENGINEERING — CTC Engineers will design Boards, Coils, and Terminal Lugs for production in quantity to fulfill whatever need may arise.

WRITE FOR CATALOG NO. 300 — for complete information on these and other CTC Electrical and Electronic Components and Hardware. No obligation, of course.

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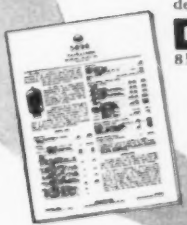

A Tube Handbook—All Types HB-3 (7¾" x 5") The "bible" of the industry—contains over 2000 pages of loose-leaf data and curves on all RCA receiving tubes, power tubes, cathode-ray tubes, phototubes, and special tubes. Three de luxe 4-prong binders imprinted in gold. Available on subscription basis. Price $10.00 including service for first year. Write to Commercial Engineering for descriptive folder and order form.

B Receiving Tube Manual—RC-15 (8½" x 5½")—256 pages including a 15-page supplement on recently added tube types. Completely revised. Contains the latest receiving tubes, including kinescopes. Features tube theory written for the layman, application data and circuits for both AM and FM equipment, and an expanded Resistance-Coupled Amplifier Section. Price 35 cents.

C Radiotron Designer's Handbook—(9" x 6")—356 pages. Edited by F. Langford Smith of Amalgamated Wireless Valve Company Pty. Ltd. in Australia. Of value to anyone interested in fundamental principles of practical circuit design. Copiously illustrated. Price $1.25.

D Power and Gas Tubes for Radio and Industry—Bulletin PG-101-A (11" x 8½")—20 pages. Contains basic data on more than 150 air-and-water-cooled transmitting tubes, rectifier tubes, thyratrons, ignitrons, and voltage regulators. Features brief descriptions, applications, terminal connection diagrams, and photos of representative types. Price 15 cents.

E Phototubes, Cathode-Ray and Special Types—Bulletin CRPS-102 (11" x 8½")—16 pages. Contains basic data on 115 gas- and vacuum-type phototubes, cathode-ray tubes, camera tubes, low-microphonic types, acorn types, and other small tubes for special applications. Includes brief descriptions, applications, terminal connections, and photos of representative types. Price 10 cents.

F Receiving Tubes for AM, FM, and Television Broadcast—Bulletin 1275-E—24 pages. Completely revised and brought up to date. Contains characteristics on more than 450 RCA receiving tubes including kinescopes and a classification chart which lists all types according to function, and group types having similar characteristics and same cathode voltage. Socket connection diagrams arranged for quick and easy reference. Price 10 cents.

G Instruction Booklets—Complete authorized information on all RCA non-receiving tube types. Be sure to mention tube-type booklet desired. Single copy on any type free on request.

Use this convenient coupon for obtaining the RCA tube literature you need.

RCA, Commercial Engineering
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- ☐ Radiotron Designer's Handbook ($1.25)* (C)
- ☐ Power and Gas Tubes for Radio and Industry (15 cents) (D)
- ☐ Phototubes, Cathode-Ray and Special Types (10 cents) (E)
- ☐ Receiving Tubes for AM, FM, and TV (10 cents) (F)
- ☐ Instruction Booklet on tube types .....(Free) (G)

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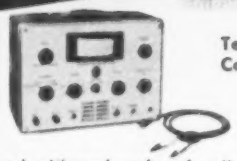
ELECTRON TUBES HARRISON, N. J.

RCA Measuring Instruments and Accessories . . . for

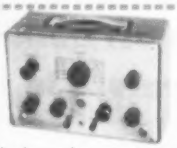


Television Calibrator WR-39B

Has crystal-calibrated markers for all TV frequencies—crystal-controlled 4.5-Mc output for alignment of TV receivers employing intercarrier sound; crystal-controlled markers 4.5 Mc removed from main marker for TV rf and if alignment; crystal-controlled markers, 250 kc removed from main marker, for sound discriminator alignment. Provision for injection of external marker. Internal af and rf modulation of variable-frequency oscillator with range of 19-110 Mc in 4 bands and 170-240 Mc in 2 bands. Crystal-calibrated heterodyne frequency meter. Useful as bar-pattern generator for making linearity adjustments.

Standard VoltOhmyst* 195-A

The "work horse" of electronic meters. Measures ac and dc voltages to 1000 volts, resistance to 1000 megohms, in six ranges. Reads db at all audio frequencies. Has zero-center scale for discriminator alignment. 10-megohm dc input resistance insures good accuracy. WG-263 accessory crystal probe permits ac voltage measurements at frequencies up to 100 Mc.



Television Sweep Generator WR-59B

Covers all TV channels, on preset fixed positions, and in addition has a continuous tuning range providing for present and future intermediate frequencies from 0.5 to 50 Mc. The rf signal is frequency-modulated at the fundamental by a precision-type vibrating capacitor. Includes blanking circuit which produces a zero-reference line on CR tube. Has 10-Mc sweep for video and if bands, and 10, 7.5, or 8-Mc sweep for rf bands. Amplitude variation is less than ±2 db. Piston attenuator has range of 20,000/1 maximum.

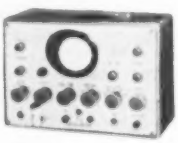
Audio Oscillator WA-54A

Has continuous frequency range of 20 to 17,000 cps. Output voltage variation under load is less than ±2 db; distortion less than 5%. Has tapped output transformer for matching a variety of load impedances. Electron-ray tube serves as calibration indicator, output level indicator, and pilot lamp. Particularly suitable for measuring response of receivers and audio amplifiers, and for checking modulation characteristics of small transmitters.

Advanced VoltOhmyst* WV-75-A

A versatile electronic volt-ohm-meter for TV and VHF measurements. The full-wave diode probe, with fitting for direct connection to coaxial lines, permits measuring peak-to-peak rf voltages of sine waves or recurrent complex waves or pulses. Frequency response is flat to 250 Mc. Also reads RMS ac and dc voltages to 1000 volts and dc resistances to 1000 megohms.

*Reg. U. S. Pat. Office.



Television Oscilloscope WO-57A

Uses 3" short-neck CR tube. Particularly useful for viewing and measuring square waves, sine waves, pulses, and TV sync signals. Has sensitivity of 30 millivolts or better per inch deflection. Frequency response of vertical amplifier flat within 2.3 db from zero to 500 kc. Employs frequency-compensated and voltage-calibrated attenuators, has calibrating voltage source. Has 60-cycle sweep with phasing control. Input capacitance less than 15 uuf with WG-214 accessory probe and cable kit.

Regulated Power Supply WP-23A

A high-quality unit designed for dependable, continuous service in shop, laboratory, and factory. Supplies zero to 300 volts, with regulated dc voltage over the range of no-load to full-load regulation, better than 1% for voltages above 50 volts. Output voltage is virtually independent of line-voltage variations as well as of load current variations. Ripple voltage is less than 8 millivolts. Delivers 120 ma over an output range of 120 to 300 volts. Insulated output terminals permit grounding of either positive or negative output terminal. Also can be used as a low-impedance "C" bias supply.

Ultra-Sensitive Dc Microammeter WV-84A

Useful for measuring very small values of current in research and industrial applications. Reads from 0.001 microampere to 1000 microamperes in six ranges. Also useful for measuring high values of resistance, or as a high-resistance voltmeter with a sensitivity of 100 megohms per volt. Accuracy, ±5% or better. Excellent for weak-current measurements in tubes, phototubes, multiplier phototubes, and dc bridges and similar low-current devices. Electronically protected, non-burn-out meter. Battery power supply.

research, production and service applications

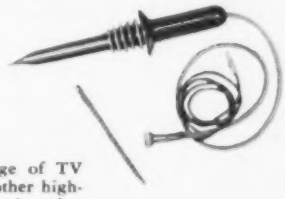
Laboratory Oscilloscope 715-B

For detailed examination of extremely short, sharp-fronted pulses and unusual waveforms. Displays steady, clear traces even with random recurrence of signal. Triggered sweep is initialed by signal observed during that sweep. Has built-in time-marker generator, and input calibrating meter. Vertical amplifier is flat within ±1 db from 5 cps to 11 Mc . . . horizontal amplifier within ±2 db from 3 cps to 500 kc. Sawtooth time base 5 cps to 100 kc. Triggered time base repetition rate up to 10 kc.

Laboratory Oscilloscope WO-79B

For detailed observation and accurate measurement of voltages produced by TV sync and deflection circuits, ignition waveforms, pulses, and radar signals. Will accurately display 1-microsecond pulses with extremely steep leading edges. Has triggered sawtooth sweep with delay network, two-to-one trace expansion, vertical amplifier flat from 10 cps to 5 Mc, calibrating meter for voltage measurements, built-in 2-microsecond delay line, intensifying and blanking amplifier.

High-Voltage Test Probe WG-289 or WG-290



For measuring voltage of TV power supplies and other high-voltage sources. Has six safety features, including anti-corona probe tip, completely insulated grip, and separate ground lead. Provides high input resistance for accurate voltage readings without loading circuit. WG-289 has microphone-type connector; WG-290 has phone-tip connectors. The following multiplier resistors available to adapt probes for practically all popular volt-ohm-meters: WG-206 . . . 1090 megohms; WG-207 . . . 991 megohms; WG-208 . . . 400 megohms; WG-209 . . . 480 megohms; WG-210 . . . 900 megohms.

Television Isotap WP-25A

A combination isolation transformer and auto transformer for safe servicing and testing of TV receivers. Provides *normal line voltage* for testing against rated specifications . . . *high line voltage* to show up intermittents and faulty components . . . *low line voltage* to test for faulty operation . . . *line isolation* to prevent shorts, shocks, or damage to test equipment . . . *line matching* from 105 to 130 volts, in 5-volt steps . . . *500 volt-amperes continuous output* from autotransformer winding, or 275 volt-ampere load from isolated secondary winding.

Rack-Adapter Panel WS-18A

For mounting any of the matched RCA Test Instruments—such as the WR-39B, WR-59B, etc.—in standard 19-inch relay racks. Adds convenience and standardization to industrial test setups. Dimensions, 10½" high, 19" wide, ⅛" thick. Finished in umber gray.

Isotap WP-24A for Radio Servicing

Eliminates shock hazard between ac/dc chassis and ground . . . speeds detection of receiver faults with high-low line tests, and facilitates testing at 117-volt design-center value. Has six-position primary switch and three secondary receptacles.

For complete technical information on any instrument or accessory, see your RCA Test Equipment Distributor, or write RCA, Commercial Engineering, Section F42Y, Harrison, N. J.

RADIO CORPORATION of AMERICA

TEST EQUIPMENT **HARRISON, N. J.**

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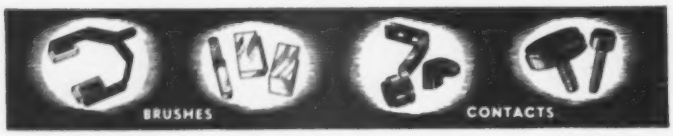
BRUSH AND CONTACT

Materials for Exacting Applications



The **GRAPHALLOY** family of metal-impregnated graphite brush and contact materials is specially designed for a wide range of applications requiring very low contact drop, very low electrical brush noise level or non-welding contact operation. Made by impregnating metals into solid graphite, they are inherently fitted for high speed, high altitude applications and for low-current circuits. Certain types are valuable for their arc-quenching characteristics in opening inductive circuits.

A few of the more commonly used types are given in the following table:

Material	Typical Current Density* Amperes per Square Inch	Typical Rubbing Speeds Feet per Minute
LOW-METAL GRADES		
Silver GRAPHALLOY	100-150 and higher	5000
Copper GRAPHALLOY	90	3000
Cadmium GRAPHALLOY	75	4000
HIGH-METAL GRADES		
Copper GRAPHALLOY	100-125	3000
Special Copper GRAPHALLOY	150	3000

*Depending on brush size.

Silver GRAPHALLOY, the supreme brush material, is widely used in brush applications where low, constant contact drop and low resistance are needed and where a low electrical noise level is imperative. Its high quality results from the use of extremely pure silver for impregnation into the graphite. Adapted for high-altitude brush applications and for low current circuits. It operates best against coin-silver slip rings.

As a **non-welding contact** material, **Silver GRAPHALLOY** is valuable in circuits where a low and constant contact drop are necessary or where contact welding must be prevented.

Copper GRAPHALLOY — This material is widely used as brush material for small and medium sized motors and generators where long brush and commutator life are important.

As a contact, certain types are extensively used for arcing and main contact tips in circuit breakers and contactors.

Cadmium GRAPHALLOY — This material is particularly adapted for commutating or opening circuits which are subject to heavy inductive arcing. The arc quenching characteristics of the Cadmium vapor which is released during arcing make this material very valuable for high duty contactors and for brush applications where wear conditions and arcing are severe.

HIGH METAL TYPES

Copper GRAPHALLOY is extensively used for rotary converter slip ring brushes, plating generator brushes and for other applications requiring extremely high current carrying capacity with low or moderate friction.

Special Copper GRAPHALLOY grades have been developed for contacts which are required to carry extremely high operating current without overheating and without sacrificing arc-quenching qualities.

APPLICATION DATA

Upon receipt of a brief description of your contact or brush problem we shall be glad to suggest a suitable design and material. We suggest that you send the current and voltage conditions, proposed rubbing speed, commutator or slip ring width and material. Send for our special brush inquiry sheet which outlines the required information.

Use GRAPHALLOY for OILLESS BUSHINGS

CHARACTERISTICS OF COMMONLY USED GRAPHALLOY GRADES

Material	Maximum Ambient Temperature In Air	In non oxidizing conditions
Babbitt GRAPHALLOY	300	300
Copper	700	1700
Bronze	600	600
Cadmium	250	550
Silver	700	1500

Coefficient of friction, .12 to .25, dry; .02 to .13 submerged.

Specify GRAPHALLOY materials which contain *no oil* and *need no oil* for efficient operation dry, submerged in liquids, or at extremely *high* or *low temperatures* where ordinary lubricants would carbonize, congeal or decompose.

Excellent for *current carrying bushings.*

Widely used for pump bushings and vanes, seal rings, stoker and high temperature conveyor bushings.

Ideal for use where ordinary bushing lubricants would contaminate food products.

Send for further information. Or, if you have a specific application, supply us the details of speed, load, shaft material and temperature conditions and we shall be glad to make recommendations or supply test samples.

Call on the accumulated design experience of our engineers for help in solving your problem.

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THE ONLY ONE OF ITS KIND

In which design engineers and purchasing agents will find a complete, accurate, and up-to-date list of the manufacturers of all types of electronic and allied products... components and complete equipment.

•

Keep it handy for ready reference throughout the year.

When buying, or requesting product information be sure to mention...

electronics BUYERS' GUIDE

WESTINGHOUSE TRANSFORMERS
FOR ELECTRONIC APPLICATIONS
Power • Plate • Filament • Pulse • Modulation

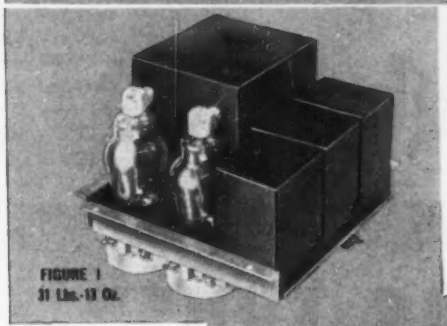


FIGURE 1
31 Lbs.-13 Oz.

The electronic gear shown in Figure 1 has conventional hermetically sealed transformer components. Figure 2 shows the weight and size reduction possible using Westinghouse Fosterite treated transformers with Hipersil cores on the same gear.

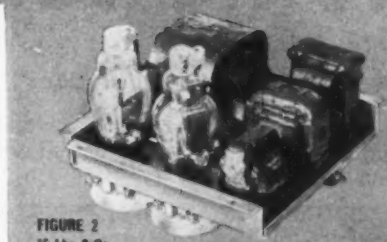


FIGURE 2
15 Lbs.-9 Oz.

Custom built for applications in low and high power Radar, electronic control, R. F. Heating and AM, FM and Television Transmitters.

FOSTERITE® TREATED

For airborne applications of dry type electronic transformers, Westinghouse *Fosterite* treated transformers have excellent moisture resistance characteristics. In small sizes, such as blocking oscillator transformers, these units are designed to withstand temperature cycling and high humidity or moisture. The *Fosterite* process keeps moisture out for successful operation of the electronic equipment and makes it possible to save the weight of enclosing cans, potting compound, etc.

OIL INSULATED (Not illustrated)

Westinghouse has oil—or inerteen-immersed, self-cooled ratings—in all KVA sizes and voltage ratings. These are particularly applicable for installations where A.C. operating voltages are higher than 8.6 KV or where the rating is higher than 150 KVA. In three-phase ratings above 1000 KVA, tap changing under load equipment, mounted integrally with the rectifier plate transformer, is often desirable. Tap changing under load gives finger tip control of plate voltage from the control stations at the transmitter in smoothly adjustable steps over a wide range of plate voltages.

HERMETICALLY SEALED

Small, light transformer components using Hipersil Cores, are now available—hermetically sealed and designed to meet the requirements of Government specifications. Ratings with higher operating voltages (3 KV and above; indoor) are equipped with bushings utilizing the exclusive Westinghouse SOLDER SEAL process—the best known means of hermetically sealing electrical apparatus. Lower voltage ratings have compression gasket bushing seals.

FIGURE 3

Figure 3—A typical group of hermetically sealed pulse transformers and chokes which were designed to meet requirements of government specifications.

Figure 4—An enclosed dry type plate transformer for 50 kilowatt FM transmitter.

DRY TYPE

There are now available for indoor mounted power supplies of the electronic circuit, transformers which, for equivalent electrical rating, are much smaller and lighter than were previously available. These savings in size and weight are due to two developments:

1. *Hipersil*® Cores which permit higher flux densities (and consequently, less electrical steel and copper).
2. Class B insulating materials which can stand much higher operating temperatures than Class A. (This means less copper.)

Thus, where the A.C. operating voltage is less than 8.6 KV and the KVA capacity is less than 150 KVA, *Dry Type* plate transformers using Class B insulation which have proven to be the ultimate in safety and service for indoor applications save the electronic design engineer valuable space in his equipment layout. Write for Booklet B-4090 which lists these outstanding advantages of the Westinghouse Dry Type electronic transformers.

FIGURE 4

Westinghouse
SPECIALTY TRANSFORMER DEPARTMENT

WESTINGHOUSE ELECTRIC CORPORATION
SHARON, PA.

Quality Controlled Electronic Tubes

Call --- Westinghouse

FOR ALL TYPES OF DEPENDABLE

ELECTRONIC TUBES

Westinghouse *offers you the right combinations . . .*

1. A COMPLETE LINE. Westinghouse provides dependable, high quality tubes for industrial and communications applications.
2. QUALITY CONTROLLED ELECTRONIC TUBES. From raw materials to finished tube, every manufacturing step is rigidly controlled and checked. This Westinghouse feature assures you of top performance.
3. REPLACEMENT TUBE SERVICE. Westinghouse Distributors throughout the country will maintain, at no obligation to you, a "Personalized Inventory" of the tubes you use, ready for immediate delivery from local stock.

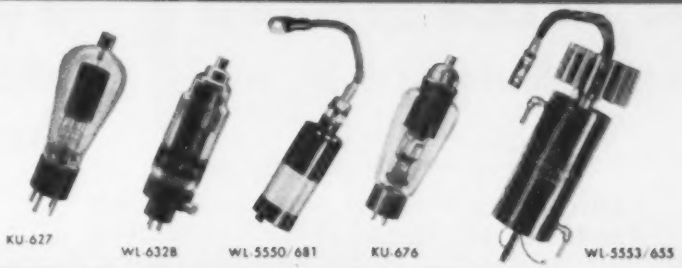
FOR COMPLETE INFORMATION SEND FOR THE . . .

Easy Guide

This Electronic Tube Guide lists tubes according to "family" classification and provides essential technical data on each tube. Send for your copy today. Electronic Tube Sales Department, Bloomfield, N. J.

RESISTANCE WELDING

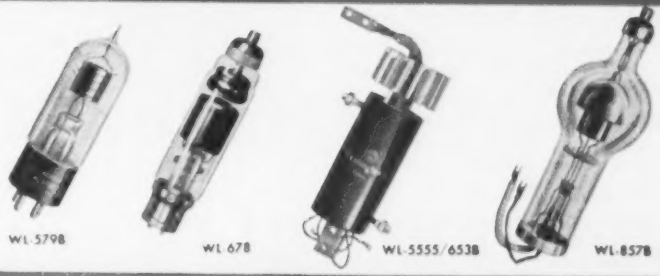
Resistance welders use two main types of tubes: Ignitrons to switch the welding current on and off, and Thyratrons to control the Ignitrons and "time" the switching to a split cycle. We carry a complete line of both types.



KU-627 WL-6328 WL-5550/681 KU-676 WL-5553/655

RECTIFIERS

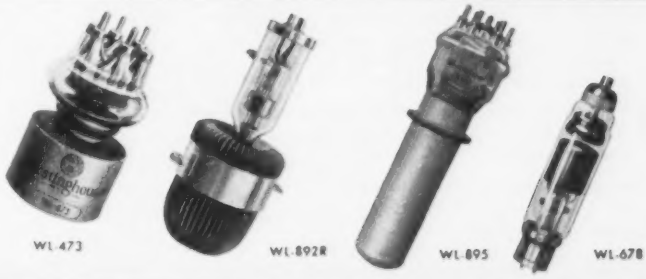
To cover the various voltage and current ratings of electronic rectifiers, we carry a complete line of Kenotrons, Phanotrons, Ignitrons, and Thyratrons. These tubes are available at our local warehouse.



WL-5798 WL-678 WL-5555/6538 WL-857B

R-F HEATING

R-F heating means Radio-Frequency Heating. This type of heating is accomplished quickly and accurately by means of high-frequency radio waves. Our local stocks of tubes for R-F heating will help solve your tube replacement worries. Replacement tubes always available in stock.



WL-473 WL-892R WL-895 WL-678

PHOTOTUBES

Phototubes can convert visible, infrared or ultra-violet light into electrical current and thus perform many tasks tirelessly and with the utmost precision. Our complete line of phototubes is stocked locally.

SR-50 WL-927 WL-928

Westinghouse *Quality Controlled Electronic Tubes*

How ALLEN ⬡ HEAD precision fastenings apply to...

RADIO • TELEVISION • INSTRUMENT AND GENERAL ELECTRICAL MANUFACTURING

For greater strength: Allen ⬡ Head Screws permit the use of smaller sizes. For instance a No. 6 Allen ⬡ Head Cap Screw is equivalent to a No. 8 conventional screw.

For space economy: Allen ⬡ Head Screws permit closer spacing of screws, eliminate projecting heads.

For greater holding power: Allen ⬡ Head Screws are insurance against avoidable costly service operations.

In hard-to-reach places: Allen ⬡ Head Screws, plus Allen Hex Keys and Drivers start screws easily and save awkward "fingering in."

For fine adjustments, close, snug fit between key and screw permits delicate adjustments that stay put.

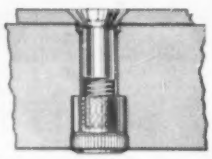
For tamper-proof settings in gauges and instruments, Allen ⬡ Head Screws can be set below surface and wax sealed.

If vibration is a factor, the precise Class 3 fit of Allen ⬡ Head Screws will "build longer trouble-free life into the product.

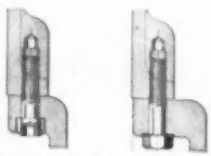
For a ready-made threaded hole, the new Allenut offers greater holding power and positive anchor in soft metals.

Allen ⬡ Head Screws are available as standard items in a wide range of sizes ranging upward from No. 4 x 1/8". NC and NF threads. Popular sizes also available in 18-8 nonmagnetic stainless steel. Set screws stocked in cup, oval, flat cone and half dog points (full dog, special).

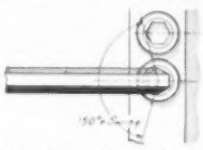
Sold only through leading distributors. Write the factory for technical information or regarding any special requirement.



Allenut and Allen Flat Head Cap Screw used to hold thin metal plate to metal base. Allenut has been pressed into counterbored hole. Will not fall out or turn against driving action.



Allen ⬡ Head Cap Screws contribute to compact designing. Can be countersunk without allowing for wrench clearance.



Allen ⬡ Heads permit close spacing impossible with conventional heads.

Firm grip without the use of weak slots or projecting heads.

WARNING
Allen-Type screws aren't necessarily Allen Made
Get genuine Proven-Formed Allen⬡Head screws in this black and silver box

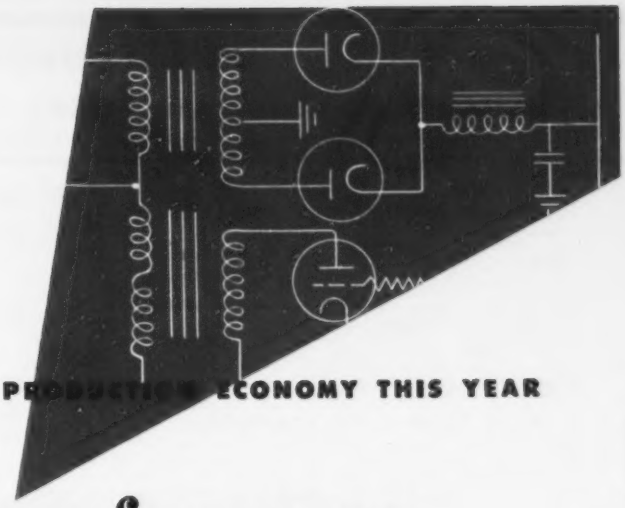
ALLEN ALLEN HEAD
MANUFACTURING COMPANY
Hartford 2, Connecticut, U. S. A.
NEW YORK · CLEVELAND · DETROIT · CHICAGO · LOS ANGELES

FOR 40 YEARS THE BUY-WORD FOR SOCKET SCREWS

If you make one or more of these products..

- Aircraft Components
- Bakery Machinery
- Business Machines
- Coin-Operated Machines
- Commercial Appliances
- Commercial Laundry, Dry Cleaning & Pressing Machinery
- Communication Equipment
- Electric Control Equipment
- Electric Motors, Generators, & Motor Generator Sets
- Electrical Equipment & Parts
- Electro-Medical Equipment
- Electronic Equipment & Devices
- Farm Equipment
- Food Processing Machinery
- Heating Equipment
- Household Appliances
- Industrial Machinery & Equipment
- Instruments & Test Equipment
- Lamps & Lighting Equipment
- Machine Tools
- Metal-Working Machinery
- Packaging Machinery
- Photographic & Projection Equipment
- Plating Equipment
- Portable Tools
- Printing Machinery
- Pumps & Compressors
- Radio & Radar Equipment
- Refrigeration & Air Conditioning Equipment
- Television Equipment
- Textile Machines
- Transportation Equipment
- Woodworking Machinery

...you can improve it with ALLEN ⬡ HEAD SCREWS



DESIGN FOR TRUE PRODUCTION ECONOMY THIS YEAR

WITH Transformers

BUILT TO MEET YOUR EXACT REQUIREMENTS

We have specialized knowledge, skill and a full range of facilities for mass-produced economical units and hermetically sealed transformers of all types, as well as for large single and 3-phase transformers.

For a superior product, priced competitively . . . for assured efficiency and long service life, let FERRANTI build transformers to your precise needs.

CHECK YOUR REQUIREMENTS

Power and Rectifier Transformers up to 50 KVA (High Voltage or High Current) . . . Saturable Reactors . . . Special Cores and High Temperature Insulation . . . Class B Hermetically sealed Types.

●

Television Transformers . . . Control Transformers . . . Audio Transformers . . . Power and Audio Filter Chokes

We invite your inquiries

Ferranti Electric, Inc.

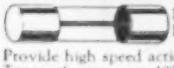
30 ROCKEFELLER PLAZA, NEW YORK 20, NEW YORK

BUSS Fuses

FUSETRON *dual-element* Fuses and Fuse Holders

for Protection of Radios, Instruments and Electronic Equipment

FAST ACTING FUSES for PROTECTION OF INSTRUMENTS, Etc.



Formerly called 8AG
Dimension ¼ x 1 inch. Glass tube.

Provide high speed action necessary to protect instruments.
Test specification—carry 100%, open at 200% in 5 seconds.
AGX are listed as approved by Underwriters' Laboratories.

Voltage	Symbol	Amperes
250 or less	**MJB**	1/500, 1/200, 3/100, or 3/32
"	**MJW**	1/16 or 1/8
"	**AGX**	1/8, 1/4, 3/8 or 1/2
125 or less	**AGX**	3/4, 1, 1 1/2 or 2

The MJW fuses are special low resistance fuses.

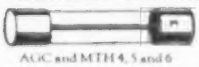
BUSS FUSES — SFE STANDARD

Fuses of different amperages are of different lengths — to make it impossible to insert too large a size — thereby preventing over-fusing.

Glass tube — diameter ¼ inch. Length as per table below.

Voltage	Symbol & Amperes	Length Inches	Pounds per 100
32 or less	**SFE 4**	5/8	.70
"	**SFE 6**	3/4	.71
"	**SFE 9**	7/8	.72
"	**SFE 14**	1 1/16	.77
"	**SFE 20**	1 1/4	.83
"	**SFE 30**	1 3/16	1.05

BUSS GLASS TUBE FUSES, ¼ x 1¼ Inch



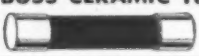
AGC and MTH 4, 5 and 6

MTH 8

Voltage	Symbol	Amperes
250 or less	**AGC**	1/8, 1/4, 3/8, 1/2, 3/4, 1, 1 1/2, 2 or 3
"	**MTH**	4, 5, 6 or 8
32 or less	**AGC**	5, 6, 7 1/2, 10, 15, 25 or 30

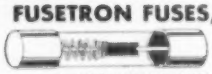
20 ampere size is an SFE 20 fuse.

BUSS CERAMIC TUBE FUSES, ¼ x 1¼ Inch



Voltage	Symbol	Amperes
125 or less	**ABC**	10, 12, 15 or 20

FUSETRON FUSES, ¼ x 1¼ Inch



Glass tube — Dual-Element type

A FUSE WITH A LONG TIME-LAG

These fuses avoid needless blows from starting currents or surges. They have a fuse link which operates only on very high overloads or short-circuits — they have a thermal cutout which functions on low overloads — the thermal cutout cannot operate quickly at any load, hence long time-lag is obtained. Yet protection is afforded against short-circuits or continued overloads.

Test specification—carry 110%, open at 135% in 1 hour.
Approximate blowing time: at 200% load 25 seconds
at 300% " 8 "
at 500% " 3 "

125 and 250 volt sizes listed as approved by Underwriters' Laboratories.
Shipping weight 0.9 lbs. per 100.

Voltage	Type	Amperes
250 or less	**MDL**	1/100, 1/32, 1/16, 3/16, 1 3/100, 3/10, 3/16, 4/10, 1/2, 5/10, 6/10 or 1
125 or less	**MDL**	1 1/4, 1 8/10, 2, or 2 1/2
32 or less	**MDL**	3 2/10, 4, 5, 6 1/4, 8, 10, 15, 20, 25 or 30

PIG-TAIL FUSES

Pig tail fuses are available in both ordinary and FUSETRON dual-element fuse types.

Write for full information.

BUSS FUSE CLIPS & CLIP ASSEMBLIES

for ¼ inch Fuses

(SFE 4, 6, 9, 14, 20 AGX, AGC, ABC, MDL, MJB, MJW, MTH fuses).

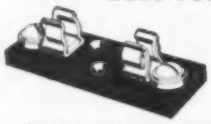
Spring bronze clips are made of Herculoy. This metal gives great gripping strength and retains spring under adverse conditions.

Beryllium copper clips combine low electrical resistance with great gripping strength. This means cooler operation of clips and fuse.

4548 Spring bronze clip, nickel plated.
4592 Beryllium copper clip, Silver plated.

Assemblies consist of clip, terminal screw, brass terminal, and mounting screw.
4431 uses No. 4548 clip — described above.
4432 uses No. 4592 clip — described above.

BUSS FUSE BLOCKS



Blocks are made of bakelite with mounting holes. Clips are of spring bronze.

Fuse blocks are made in many sizes and types.

Tell us your requirements.

BUSS PANEL MOUNTED HOLDERS

for ¼ inch Fuses

Holders are inserted through hole in panel and locked in place by nut on holder. Can be used on panels up to 5/16 thick.

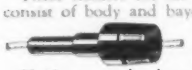
Bayonet type knob requires only quarter turn to remove fuse. No screw driver is needed.

Normal current carrying capacity: 15 amperes.
HJM for ¼ x 1 inch fuses (AGX, MJB, MJW, SFE 14)
HKP for ¼ x 1¼ " " (ABC,AGC,SFE20,MDL,MTH)

IN-THE-LINE HOLDERS

for ¼ inch fuses

These holders are for mounting fuse in wire. Holders consist of body and bayonet type knob — two contacts



ready to be staked on ends of wire — a pressure spring that is used under contact in base of holder.

Holders can also be mounted in panel up to 5/16 inch thick by means of a No. 9969 Spring nut (not furnished). Flat spot on holder permits it to be locked against rotation.

Normal current carrying capacity: 15 amperes.
Shipping weight, holders: 4 lbs. per 100.
Symbol
HDJ for ¼ x 1 inch fuses (AGX, MJB, MJW, SFE 14)
Takes No. 18 or smaller wires.
HDJ-A for ¼ x 1¼ inch fuses (ABC, AGC, MDL, MTH, SFE 20)
Takes No. 18 or smaller wires.
HDJ-B for ¼ x 1¼ inch fuses (as above)
Takes No. 14 or 16 wires.
No. 9969 Spring nut for panel mounting above holders.

Holder-and-Fuse Assemblies

Assembly consists of holder, fuse and 19 inch loop of No. 14 wire already staked and soldered to terminals.

Offer simplest way to install protection. Wire can be cut to give leads of desired length. A spring nut, furnished with holder, can be used to mount holder on panel up to 3/32 inch thick.

HRJ Complete with SFE 20 fuse
HRI Complete with SFE 14 fuse
HRH Complete with SFE 9 fuse

GET FULL INFORMATION

Ask for bulletin SFB on Small Dimension
BUSS FUSES — FUSETRON FUSES — HOLDERS
BUSSMANN MFG. CO., University at Jefferson, St. Louis 7, Mo.
Division McGraw Electric Company

For Reliability, I use

OHMITE

BROWN DEVIL RESISTORS

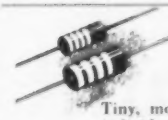
Sturdy, wire-wound, vitreous-enameled resistors for voltage dropping, bias units, bleeders, etc. In 5, 10, and 20-watts; values to 100,000 ohms.

FIXED RESISTORS

Resistance wire is wound over a ceramic core, permanently locked in place, insulated and protected by Ohmite vitreous enamel. In 25, 50, 100, 160, and 200-watt stock sizes; values from 1 to 250,000 ohms.

DIVIDOHM RESISTORS

You can quickly adjust these handy vitreous-enameled resistors to the exact resistance you want, or put on taps wherever needed for multi-tap resistors and voltage dividers. In sizes from 10 to 200 watts, to 100,000 ohms.



LITTLE DEVIL* COMPOSITION RESISTORS

Tiny, molded, fixed resistors—individually marked with resistance and wattage rating—½, 1, and 2-watt sizes, ±10% tol. Also ±5% tol. 10 Ohms to 22 megohms.

DUMMY ANTENNA RESISTORS

For loading transmitters or other r.f. sources. New, rugged, vitreous-enameled units are practically non-reactive within their recommended frequency range. 100 And 250-watt sizes, 52 to 600 ohms, ±5%.

MOLDED* COMPOSITION POTENTIOMETER

A high-quality, 2-watt unit with a good margin of safety. Resistance element is solid molded—not a film. The noise level is low and decreases with use.

CLOSE CONTROL RHEOSTATS

Insure permanently smooth, close control. Widely used in industry. All ceramic, vitreous enameled; 25, 50, 75, 100, 150, 225, 300, 500, 750, and 1000-watt sizes.

DIRECTION INDICATOR POTENTIOMETER

Compact, low cost. Used in a simple potentiometer circuit as a transmitting element to remotely indicate the position of a rotary-beam antenna.

HIGH-CURRENT TAP SWITCHES

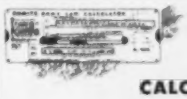
Compact, all-ceramic, multipoint, rotary selectors for a-c use. Self-cleaning, silver-to-silver contacts. Rated at 10, 15, 25, 50, and 100 amperes. Two or more can be mounted in tandem.

POWER LINE CHOKES

Keep r.f. currents from going out over the power line and causing interference with radio receivers. Also used to stop incoming r.f. interference. Has a ceramic core and moistureproof coating. In 5, 10, and 20 amps.

RADIO FREQUENCY CHOKES

Single-layer wound on low power-factor steatite or bakelite cores, with moistureproof coating. Seven stock sizes for all frequencies, 3 to 520 mc. Two units rated 600 ma, others rated 1000 ma.



NEW OHM'S LAW CALCULATOR

Redesigned! Figures all Ohm's Law problems, including parallel resistance, with one setting of the slide. Also has standard slide rule scale. Send 25c in coin.

Allen-Bradley Company, has arranged for the Type AB (Allen-Bradley Type J) control and Little Devil Molded Composition Resistors (Allen-Bradley Types RB, GB, and HB) to be available from stock at Ohmite distributors.

SEND FOR CATALOG NO. 40
on Company Letterhead

Provides 96 pages of engineering information

OHMITE MANUFACTURING CO.
4975 Flourney St., Chicago 44, Ill.

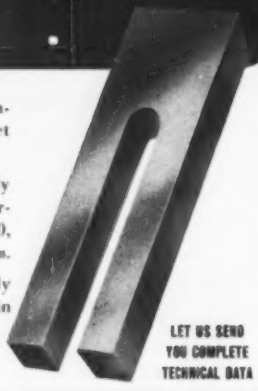
Be Right with OHMITE

Tuning Forks
for precision frequency control . . . .

Philamon Laboratories manufactures a complete line of tuning fork resonators to meet your frequency control requirements.

Temperature-compensated and hermetically sealed, the resonators are available in accuracies from 1 part in 3,000 to 1 part in 100,000, for operation over wide temperature ranges.

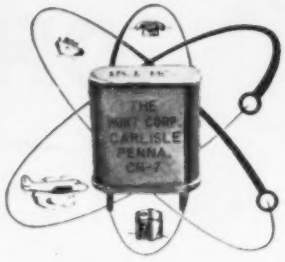
The resonators may be obtained individually —as a part of compact sub-assemblies—or in completely engineered equipment.



LET US SEND YOU COMPLETE TECHNICAL DATA

PHILAMON LABORATORIES
3717 Third Avenue, Brooklyn 20, N. Y.

STABILITY
HUNT CR-7 CRYSTAL



Miniature Type CR-7 Crystal Unit

(Illustration is actual size)

THE Hunt CORPORATION

CARLISLE 2, PENNSYLVANIA

Measure Time ACCURATELY
10 MICROSECONDS TO 1 SECOND

THE AMERICAN
HIGH SPEED CHRONOSCOPE

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Klystrons

A complete line of Sperry Klystron tubes covering a range of 750-14,800 megacycles is available for industrial use. These include transmitting types and local oscillators.

Type	Description	Frequency Range	Power Output	Beam Voltage	Reflector Voltage	Fittings
2K41	Reflex Oscillator	2660-3310	250mw*	1250	−750	2-SKL
2K42	Reflex Oscillator	3300-4200	250mw*	1250	−750	1-SKL
2K43	Reflex Oscillator	4200-5700	250mw*	1250	−750	1-SKL
2K44	Reflex Oscillator	5700-7500	250mw*	1250	−750	1-SKL
2K39	Reflex Oscillator	7500-10,300	250mw*	1250	−750	1-SKL
SRX16A	Reflex Oscillator	10,000-14,800	50-20mw	1250	−750	1-SKL
3K27	Reflex Oscillator	750-960	1-3w	1000	−1500	1-SKL
3K23	Reflex Oscillator	950-1150	1-5w	1000	−1500	2-SKL
SRL7C	Reflex Oscillator	1825-2100	5-10w	1000	−1000	Type N
SRC20	WG Reflex	4400-4600	1-5w	1000	−1000	Waveguide (2"x1")
SRC21	WG Reflex	4600-4800	1-5w	1000	−1000	Waveguide (2"x1")
SRC12	WG Reflex	4800-5000	1-5w	1000	−1000	Waveguide (2"x1")
SRC13	WG Reflex	5000-5200	1-5w	1000	−1000	Waveguide (2"x1")
SRC8 Series	26 Reflex Oscillators	5500-7800	0.2-1.5w	1250	−1750	Waveguide (1½"x½")
3K21	Oscillator Amplifier	2300-2725	15-20w	3000	none	4-SKL
3K30	Oscillator Amplifier	2700-3300	20-30w	3000	none	4-SKL
3K22	Oscillator Amplifier	3300-4000	15-20w	3000	none	4-SKL
2K47	Frequency Multiplier	250-280 in 2250-3360 out	125-250mw	1000	none	4-SKL
2K46	Amplifier-Multiplier	2730-3330 in 8190-10,000 out	10-70mw	1500	none	5-SKL
2K34	Oscillator-Buffer	2730-3330	16w*	3000	none	2-SKL
2K35	Cascade Amplifier	2730-3330	25-35w	3000	none	3-SKL
SMC11 Series	Frequency Multiplier	773.5-831.1 in 4640-5815 out	.3w	1000	none	2-BNC 1-SKL
SMX32	Frequency Multiplier	4500-5200 in 9000-10,500 out	1w	1000	none	BNC

*Minimum rated power output.

Microline test equipment

In this group of test equipment is virtually every type of instrument essential to precision microwave measurements, covering every microwave frequency band.

Microline test instruments are also available in waveguide sizes for frequencies from 12,400 to 18,000 mc; 18,000 to 26,500 mc; and 26,500 to 40,000 mc. Every instrument does not cover the entire band width listed here; however as much band width as possible is maintained, limited only by the utility and accuracy required. Development of new instruments is continuous. Your inquiry for special requirements is solicited.

IMPEDANCE METERS

Model	Description	Reading Accuracy	Constancy of Probe Coupling	Detector Element	Fittings Input	Fittings Output
299	2600-4000	±0.1mm	±2%	1N21B-821 Barretter	UG-214/U	UG-214/U
103B	4000-6000	±0.1mm	±2%	1N23B-821 Barretter	UG-149A/U	UG-149A/U
116A	3500-7000	±0.1mm	±2%	1N23B-821 Barretter	UG-141/U	UG-140/U
145	8100-12,400	±0.1mm	±2%	1N23B-821 Barretter	UG-39/U	UG-39/U
201	5300-8200	±0.1mm	±2%	1N23B-821 Barretter	UG-344/U	UG-344/U
320	18,000-26,500	±0.01mm	±2%	1N26	UG-425/U	UG-425/U
346	26,500-40,000	±0.01mm	±2%	1N53	UG-381/U	UG-381/U
361A	650-4000	±0.1mm	±2%	1N21B	UG-46/U	UG-45/U

IMPEDANCE TRANSFORMERS

Model	Description	Frequency Range mc	Max. VSWR	Fittings
137	Double Stub	2660-10,300	—	Type N Jack
301	Double Slug	2600-4000	10.	UG-214/U
347	Susceptance Waveguide	0.360"x0.220" 26,500-40,000	1.0-35	UG-381/U
34A	Triple-Stub ⅞" Coaxial	1700-3750	50	UG-46/U and UG-45/U
109B	Double-Slug Waveguide	2"x1" 4000-6000	8-14	UG-149A/U
117B	Susceptance Waveguide	2"x1" 4000-6000	1.0-40	UG-149A/U
146	Double-Slug Waveguide	1"x½" 8100-12,400	8-14	UG-39/U
178	Susceptance Waveguide	1"x½" 8100-12,400	1.0-40	UG-39/U
202	Susceptance Waveguide	1½"x¾" 5300-8100	1.0-40	UG-344/U
363	Double-Slug ⅞" Coaxial	650-3700	5-6	UG-46/U and UG-45/U

FREQUENCY METERS

Model	Description	Frequency Range mc	Absolute Accuracy	Approximate Loaded Q	Fittings R-F	Fittings Video
S22	Detector Wavemeter Kit	2400-3400	1/2000	1000	Type N	UHF
27A	Coaxial	3500-6500	1/1000	400	Type N	UHF
28B	Cavity	4010-6000	1/10,000	7000	UG-149A/U	UHF
174B	Broadband Coaxial	660-3000	1/1000	400-600	Type N	UHF
126	Coaxial	8100-10,200	1/2000	900	UG-39/U Flange	none
207	Coaxial	5300-8100	1/2000	800	Type N	UHF
208A	Cavity	5490-8100	1/10,000	7000	UG-344/U	UHF
273	Cavity	8100-11,900	1/10,000	5000	UG-39/U	UHF
291A	Cavity	2575-3780	1/10,000	10,000	Type N	UHF
348	Cavity	13,800-18,000	1/1000	1000	UG-419/U	UG-419/U
349	Cavity	19,000-26,000	1/1000	450	UG-425/U	UHF
350	Cavity	26,500-39,000	1/1000	1000	UG-381/U	UG-381/U

BARRETTER MOUNTS

Model	Description	Barretter Type	Frequency Range mc	Max. VSWR	Fittings Input	Fittings Output
83A	2"x1" Waveguide	821	4600-5650	1.5	UG-149A/U	UHF
85	Type N Coaxial	821	2700-2900	1.8	Type N Plug	
143	⅞" Coaxial (tunable)	811	500-2500	2.0	UG-46/U	UHF
163	Type N Coaxial	821	2500-2700	1.8	Type N Plug	UHF
164	Type N Coaxial	821	2900-3100	1.8	Type N Plug	UHF
184	1"x½" Waveguide	821	8500-9600	1.5	UG-39/U	UHF
212	1½"x¼" Waveguide	821	6000-7600	1.5	UG-344/U	UHF
245	2"x1" Waveguide	821	3700-4500	1.5	UG-149A/U	UHF
253	1½"x¾" Waveguide	821	5300-6600	1.7	UG-344/U	UHF
285	Type N Coaxial	821	3100-3300	1.8	Type N Plug	UHF
313	1½"x¼" Waveguide	821	6600-8100	1.5	UG-344/U	UHF

DIRECTIONAL COUPLERS

Model	Description	Frequency Range mc	Coupl. Attenuation	Fittings Line In	Fittings Line Out
209	1½"x½" Waveguide	5300-8100	24 db	UG-344/U	UG-344/U
233	2"x1" Waveguide	4000-6000	24 db	UG-149A/U	UG-149A/U
234	1"x½" Waveguide	8100-12,400	40 db	UG-39/U	UG-39/U
235	1"x½" Waveguide	8100-12,400	20 db	UG-39/U	UG-39/U
236	1"x½" Waveguide	8100-12,400	24 db	UG-39/U	UG-39/U
237	1½"x¾" Waveguide	5300-8100	30 db	UG-344/U	UG-344/U
321	2"x1" Waveguide	4000-6000	30 db	UG-149A/U	UG-149A/U
322	2"x1" Waveguide	4000-6000	40 db	UG-149A/U	UG-149A/U
405	0.360"x0.220" Waveguide	26,500-39,000	20 db	UG-381/U	UG-381/U
413	½"x¼" Waveguide	18,000-26,500	20 db	UG-425/U	UG-425/U
415	½"x¼" Waveguide	18,000-26,500	40 db	UG-425/U	UG-425/U
306	3"x½" Waveguide	2600-4000	30 db	UG-214/U	UG-214/U
344	0.702"x0.390" Waveguide	12,400-17,000	20 db	UG-419/U	UG-419/U
429	0.360"x0.220" Waveguide	32,000-39,000	10 db	UG-381/U	UG-381/U
341	¼" Coaxial	850-2400	33 db	UG-46/U	UG-45/U
711	¼" Coaxial	950-1150	40 db	UG-46/U	UG-45/U
712	¼" Coaxial	1080-1300	40 db	UG-46/U	UG-45/U
714	¼" Coaxial	1260-1540	40 db	UG-46/U	UG-45/U
730	⅛" Coaxial	2470-3130	26.5 db	UG-46/U	UG-20/U (Type N)
775	⅛" Coaxial	660-840	40 db	UG-46/U	UG-45/U
794	⅛" Coaxial	830-1050	40 db	UG-46/U	UG-45/U

Other broad band coaxial directional couplers are available covering a range from 480 mc to 4000 mc.

SHORTS

Model	Description	Frequency Range mc	Fitting
114A	2"x1" Waveguide	4000-6000	UG-149A/U
203	1½"x½" Waveguide	5300-8200	UG-344/U
371	0.360"x0.220" Waveguide	26,500-40,000	UG-381/U
372	0.702"x0.391" Waveguide	12,400-18,000	UG-419/U
377	1"x½" Waveguide	8100-12,400	UG-39/U
636	⅛" Coaxial	700-4000	UG-46/U-Female

TERMINATIONS

Model	Description	Frequency Range mc	Power Capacity	VSWR	Fittings
105	2"x1" Waveguide	4000-6000	1w	1.04	UG-149A/U
113	2"x1" Waveguide	4000-6000	310w	1.10	UG-149A/U
150	1"x½" Waveguide	8100-12,400	1w	1.04	UG-39/U
213	1½"x¾" Waveguide	5300-8200	150w	1.10	UG-344/U
214	1½"x¾" Waveguide	5300-8200	1w	1.04	UG-344/U
230	3"x1½" Waveguide	2600-4000	1900w	1.15	UG-51/U
240	2"x1" Waveguide	4000-6000	875w	1.15	UG-149A/U
246	1"x½" Waveguide	8100-12,400	100w	1.10	UG-39/U
308	3"x1½" Waveguide	2600-4000	1w	1.04	UG-214/U
400	1"x1½" Waveguide	8100-12,400	175w	1.15	UG-39/U
401	0.702"x0.391" Waveguide	12,400-18,000	100w	1.15	UG-419/U
402	0.360"x0.220" Waveguide	26,500-40,000	18w	1.15	UG-383/U
637	⅛" Coaxial	650-3500	12w	1.4	UG-46/U Female

ATTENUATORS

Model	Description	Frequency Range mc	Attenuation Range	Accuracy	Power Capacity	Fittings
110	Variable	4000-6000	0-20 db	Uncalibrated	1w	UG-149A/U & UG-149A/U (2"x1")
127A	Precision Variable	29-32	15-95 db	±0.2 db	1w	UG-19/U (Type N)
134A	Calibrated Variable	8500-9600	2-45 db	±0.5 db	1w	UG-39/U (1"x½")
152	Variable	8500-9600	2-15 db	Uncalibrated	1w	UG-39/U (1"x½")
173	Calibrated Fixed	8500-9600	3 db	±0.5 db	1w	UG-39/U (1"x½")
174	Calibrated Fixed	8500-9600	6 db	±0.5 db	1w	UG-39/U (1"x½")
183	Calibrated Fixed	8500-9600	10 db	±0.5 db	1w	UG-39/U (1"x½")
215	Calibrated Variable	5300-8100	2-20 db	±0.5 db	1w	UG-344/U (1½"x¾")
216	Variable	5300-8100	2-20 db	Uncalibrated	1w	UG-344/U (1½"x¾")
289	Variable	4000-6000	2-20 db	Uncalibrated	1w	UG-149A/U (2"x1")
290	Calibrated Variable	4000-6000	2-20 db	±0.5 db	1w	UG-149A/U (2"x1")
292	Variable	7000-10,000	2-20 db	Uncalibrated	1w	UG-51/U (1¼"x⅝")
293	Calibrated Variable	7000-10,000	2-20 db	±0.5 db	1w	UG-51/U (1¼"x⅝")
294	Variable	2600-4000	2-16.5 db	Uncalibrated	1w	UG-214/U (3"x1½")
295	Variable	2600-4000	2-16.5 db	Uncalibrated	1w	UG-214/U (3"x1½")
374	Variable	26,500-39,000	15 db	Uncalibrated	½w	UG-381/U (0.360"x0.220")

DETECTORS AND MIXERS

Model	Description	Frequency Range mc	Detector Element	Fittings Input	Fittings Local osc.	Fittings Output
357	Detector 0.702"x0.391" Waveguide	12,400-18,000	1N26 Crystal	UG-419/U	none	UHF
358	Detector ½"x¼" Waveguide	18,000-26,500	1N26 Crystal	UG-425/U	none	UHF
359	Detector 0.360"x0.220" Waveguide	26,500-40,000	1N53 Crystal	UG-381/U	none	UHF
360	Detector 1"x½" Waveguide	7500-9600	1N23B Crystal 821 Barretter	UG-39/U	none	UHF
111A	Detector Sect.	4000-6000	1N23B	UG-149A/U	none	UHF
206	Detector Sect.	5300-8200	1N21B	UG-344/U	none	UHF
364	Detector Sect.	7000-10,000	1N23B	UG-51/U	none	UHF
335	Mixer	5850-8200	1N23B	UG-344/U	Type N	UHF
337	Mixer CV-52/U ⅛" Coaxial	2600-4000	1N23B Crystal	Type N Female	Type N	UHF
378	Mixer	2600-4000	1N23B	UG-214/U	Type N	UHF
379	Mixer	8100-12,400	1N23B	UG-39/U	UG-39/U	UHF
382	Mixer	26,500-40,000	1N53	UG-381/U	UG-381/U	UHF

ADAPTERS

Model	Description	Frequency Range mc	Fittings Input	Fittings Output
100A	⅛" Coaxial to 2"x1" Waveguide	4000-6000	UG-140/U Male	UG-149A/U
101A	⅛" Coaxial to Type N	0-7000	UG-140/U Male	Type N Jack
144A	3"x½" Waveguide to ⅛" Coaxial	2600-4000	UG-214/U	UG-45/U Male
167A	1"x½" Waveguide to Type N	8100-12,400	UG-39/U Flange	Type N Jack
204	1½"x¾" Waveguide to Type N	5300-8200	UG-344/U	Type N Jack
217	⅛" Coaxial to Type N	0-4000	UG-45/U Female	Type N Jack
248	2"x1" Waveguide to Type N	4000-6000	UG-149A/U	Type N Jack
249	1¼"x⅝" Waveguide to Type N	7000-10,000	UG-51/U	Type N Jack
250	3"x1½" Waveguide to Type N	2600-4000	UG-214/U	Type N Jack
251	Waveguide to Coaxial	5300-7000	UG-344/U	UG-140/U
286A	Coaxial to Type N	0-7000	UG-140/U	UG-290/U (BNC)
352A	⅛" Coaxial to Type N	0-4000	UG-45/U Male	Type N Jack
354A	⅜" Coaxial to ⅞" Coaxial	0-4000	UG-45/U	UG-45/U
355A	⅜" Coaxial to ⅞" Coaxial	0-4000	UG-46/U	UG-46/U
398	Waveguide to Coaxial	2690-4000	UG-214/U	UG-140/U
486A	SKL to Waveguide Transformer Adapter	8100-12,400	UG-39/U	SKL

MAGIC TEES

Model	Frequency Range MC	Max. VSWR (Any Arm)	Min. Isolation (Shunt to Series)	Fittings
323	2600-4000	2	35	UG-53/U
390	18,000-26,500	2	35	UG-425/U
391	26,500-40,000	2	35	UG-381/U
406	8100-12,400	2	35	UG-39/U

TEES AND BENDS

Model	Description	Frequency Range mc	Fittings
106A	2"x1" Waveguide—Series Tee	4000-6000	UG-149A/U
107A	2"x1" Waveguide—Shunt Tee	4000-6000	UG-149A/U
165A	1"x½" Waveguide—Series Tee	8100-12,400	UG-39/U
166A	1"x½" Waveguide—Shunt Tee	8100-12,400	UG-39/U
170	1"x½" Waveguide—E-Plane Bend	8100-12,400	UG-39/U
171	1"x½" Waveguide—H-Plane Bend	8100-12,400	UG-39/U
274	3"x1½" Waveguide—Series Tee	2600-4000	UG-214/U
275	3"x1½" Waveguide—Shunt Tee	2600-4000	UG-214/U
276	1½"x¾" Waveguide—Series Tee	5300-8200	UG-344/U
277	1½"x¾" Waveguide—Shunt Tee	5300-8200	UG-344/U
278	1¼"x⅝" Waveguide—Series Tee	7000-10,000	UG-51/U
279	1¼"x⅝" Waveguide—Shunt Tee	7000-10,000	UG-51/U
392	0.702"x0.391" Waveguide—Series Tee	12,400-18,000	UG-419/U
393	0.702"x0.391" Waveguide—Shunt Tee	12,400-18,000	UG-419/U
394	½"x¼" Waveguide—Series Tee	18,000-26,500	UG-425/U
395	½"x¼" Waveguide—Shunt Tee	18,000-26,500	UG-425/U
396	0.360"x0.220" Waveguide—Series Tee	26,500-40,000	UG-381/U
397	0.360"x0.220" Waveguide—Shunt Tee	26,500-40,000	UG-381/U

For detailed information write Industrial Department

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advanced type BT resistors

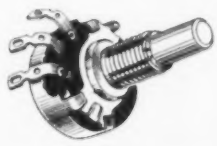
Meet JAN-R-11 specifications at ⅓, ½, and 1 and 2 watts. Small insulated Composition Resistors, up to 22 megohms in RMA Ranges. Catalog BG-1.

type BW wire wound resistors

Exceptionally stable and inexpensive for low range requirements. Fully insulated ½, 1 and 2 watts in RMA Ranges up to 8200 ohms. Catalog BG-2.

new type Q controls

Compact 1⅝" design. ¼ watt rating. Available with or without tap and switch. Lustrous nickel-plated finish meets federal salt-spray requirements. Catalog BG-3.

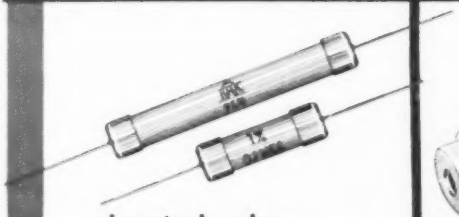


type MVX high ohmic high voltage resistors

Meet requirements for a small high range unit with axial leads. Can be mounted through a hole in a mounting block of insulating material without terminal interference. Power rating is 2 watts. Catalog BG-18.

finger-tip controls and switches

Nickel-size, wafer-thin controls with famous IRC element. Simplified construction enables this control to fill applications where small size must combine with dependability. Catalog BG-9.



deposited carbon PRECISTORS

Combine accuracy and economy in close tolerance applications. Tiny, lightweight units in wide range of values, and 3 tolerances—1%, 2% and 5%. Catalog BG-14.

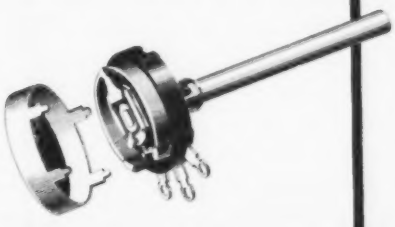
type MF voltmeter multipliers

Interconnected and encased in sealed ceramic tubes. Completely impervious to humidity. 0.5 meg. to 6 meg. Catalog BG-15.

VARIABLE RESISTORS

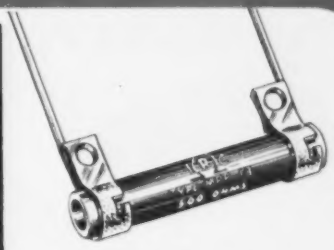
wire wound potentiometers

Two watt control. 1¼" diameter. Wide variety of rheostat and potentiometer applications. Catalog BG-4.



type MW wire wound resistors

Flat wire wound resistors, completely insulated and protected. Unique design permits savings in cost and space. Catalog BG-5.

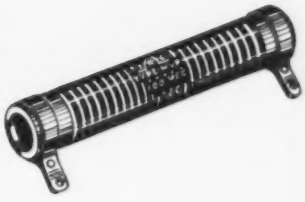


type MP high frequency resistors

For frequencies above those of conventional resistors. 2 watts to 90 watts. (MPM's are tiny, ¼-watt units ideal for miniaturization.) Catalog BG-6.

precision wire wound resistors

Maximum accuracy and dependability in instrument applications. 1% tolerance standard. Variety of terminal types. Catalog BG-10.



type MV high voltage resistors

For use where high resistance and power are required. 2 watts to 90 watts. Variety of terminal types. Catalog BG-11.

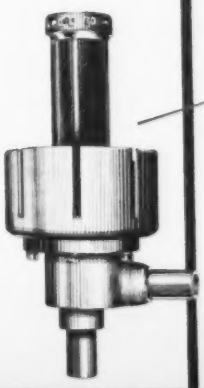
power wire wound resistors

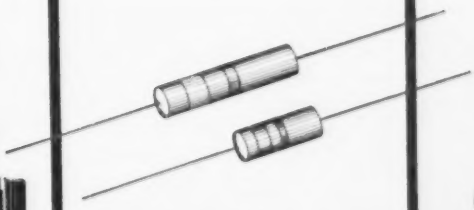
(Tubular or Flat)

Full range of sizes, types, terminals. Special cement coating resists humidity and aids heat dissipation. Catalogs BG-12 and BG-13.

type LP water cooled resistors

High-frequency, high-power resistor, cooled by high velocity stream of water. Power dissipation up to 5 KW. 35 ohms to 1500 ohms. Elements interchangeable. Catalog BG-16.





insulated chokes

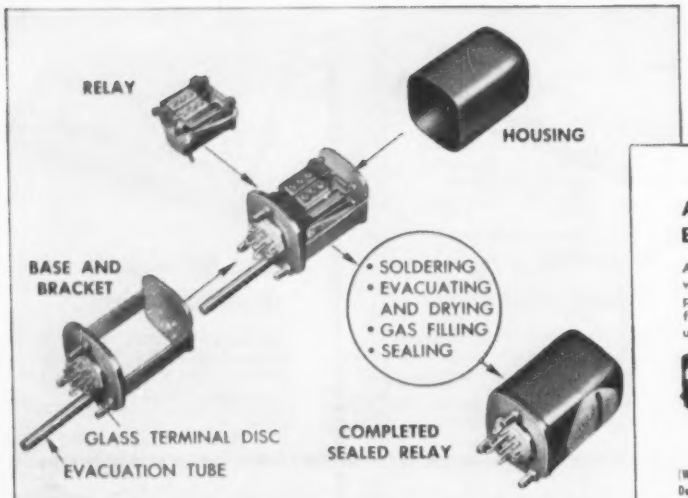
Ideal for television and similar circuits. Wide range of size and characteristic combinations permit accurate specification to individual requirements. Inexpensive and versatile. Catalog BG-17.

IRC

Wherever the Circuit Says ~~~

INTERNATIONAL RESISTANCE COMPANY

Make atmosphere a part of your product



Electro-Seal Hermetic Sealing Service consists of providing the design, enclosure, base, brackets and terminals. We assemble, wire and seal your component in an atmosphere of dry, inert gas. Enclosure is evacuated by high vacuum system and thoroughly tested for leaks by means of a mass spectrometer.

A FEW STANDARD TYPES OF ELECTRO-SEAL ENCLOSURES

All Electro-Seal Enclosures can be equipped with individual terminals, multiple headers or plug-in arrangements as well as mounting flanges or studs. Dimensions given are inside usable dimensions.

SERIES 5-E

(Dia: 1½", Depth: 1⅞", Overall Outside Ht.: 2¾₆"). Normally equipped with octal plug.

SERIES 6-E

(Width: 1⅞", Length: 4⅜", Depth: 2¹⁵⁄₁₆", Overall Outside Ht.: 3¹⁄₁₆"). Size frequently permits sealing several components within the enclosure.

SERIES 8-E

(Dia: 2¹⁵⁄₆₄", Depth: 2⅞", Overall Outside Ht.: 3½"). Normally equipped with octal plug. Maximum base area required: 2½" x 2½".

SERIES 13-E

(Width: 1⁹⁄₆₄", Length: 1³³⁄₆₄", Depth: 2⅝₆", Overall Outside Ht.: 2⅜"). Base provided with three mounting studs.

SERIES 14-E

(Width: 1⁹⁄₁₆", Length: 2⅝", Depth: 2¹¹⁄₃₂", Overall Outside Ht.: 2½") Size frequently permits sealing of several items within the enclosure.

Electro-Seal Hermetic Sealing Increases Usefulness, Life and Freedom from Maintenance of Many Types of Electrical Products

No matter how efficient and dependable your product . . . relay, transformer, flasher, timer, amplifier, vibrator or other electrical device . . . it will only operate most reliably in "ideal" atmosphere.

Electro-Seal Hermetic Sealing Service permanently surrounds your product with atmosphere free of moisture, dust, fungi or pressure changes . . . makes it tamper-proof.

For aircraft use, hermetic sealing guards against failure caused by varying air pressure and condensation. In industry, it provides a safe enclosure in hazardous locations and complete protection from dirt and dust.

Let us show you how Electro-Seal Hermetic Sealing Service can add to the life and reliability of your product by making atmosphere a "built-in" part of the product.

Enclosures can be made up by temporary tools to provide small quantities for engineering samples or limited production schedules. We invite you to send complete engineering information and samples of parts to be hermetically sealed.

ELECTRO-SEAL CORPORATION

946 LEE STREET • DES PLAINES, ILLINOIS

Now, as in 1930

Jensen SPEAKERS LEAD THE FIELD!

● 20 years ago, this ad appeared in the first issue of ELECTRONICS. That was June 1930. Jensen was already established and recognized as the leading producer of fine loud speakers.

Continuing its leadership throughout the years, Jensen is today supplying industry, government, the arts and sciences and the home with the *finest loudspeakers that money can buy*. Jensen offers all types, in any quantity, to meet exact needs. May we have the privilege of working on your loudspeaker problem?

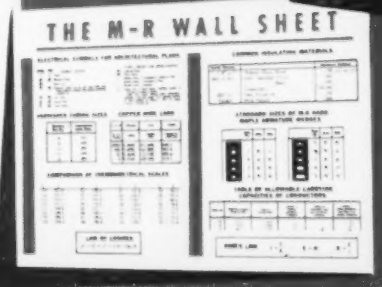
JENSEN MANUFACTURING COMPANY *Division of The Muter Company*
6601 So. Laramie Ave., Chicago 38, Illinois • *In Canada: Copper Wire Products, Ltd., 351 Carlew, Toronto*

MITCHELL-RAND

the electrical insulation headquarters for 61 years

FREE FOR THE ASKING!

Write today for your Free Varnished Tubing samples ranging from size 0 to 20 to fit wires from .032 to .325 inches . . . other valuable aids, are the M-R Guide Book of Electrical Insulation . . . the Wall Chart with reference tables, electrical symbols, allowable capacities of conductors, dielectric averages, thicknesses of insulation and tap drill sizes . . . and the M-R Wax and Compound Guide Book . . . they are full of valuable information . . . write for them on your letterhead.



MITCHELL-RAND INSULATION CO. Inc.

A PARTIAL LIST OF M-R PRODUCTS: FIBERGLAS VARNISHED TUBING, TAPE AND CLOTH • INSULATING PAPERS AND TWINES • CABLE FILLING AND BOTHEAD COMPOUNDS • FRICTION TAPE AND SPLICE • TRANSFORMER COMPOUNDS • FIBERGLAS SATURATED SLEEVING • ASBESTOS SLEEVING AND TAPE • VARNISHED CAMBRIC CLOTH AND TAPE • MICA PLATE, TAPE, PAPER, CLOTH, TUBING • FIBERGLAS BRAIDED SLEEVING • COTTON TAPES, WEBBINGS AND SLEEVINGS • IMPREGNATED VARNISH TUBING • INSULATED VARNISHES OF ALL TYPES • EXTRUDED PLASTIC TUBING

If You Have a Tough Connector Problem, Ask

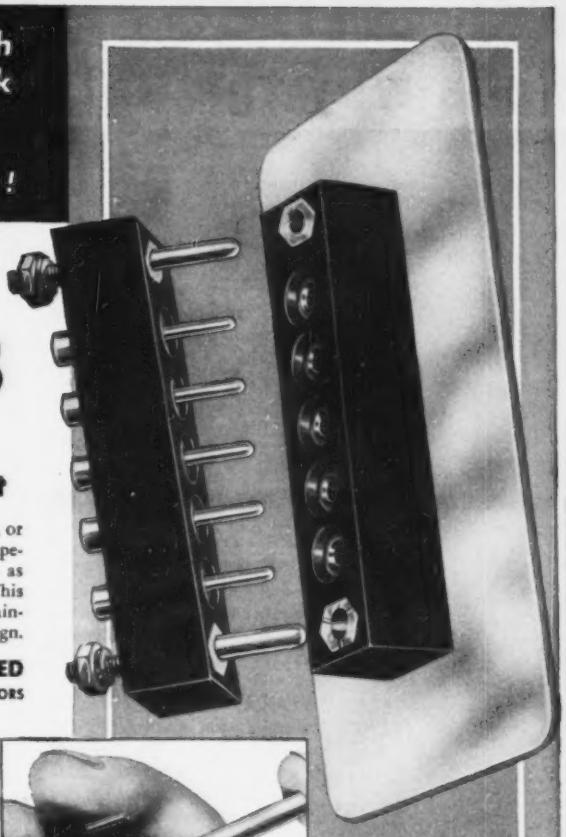
BREEZE

FOR THE ANSWER!

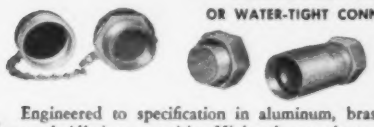
SPECIAL CONNECTORS

for advanced radar and electronic equipment

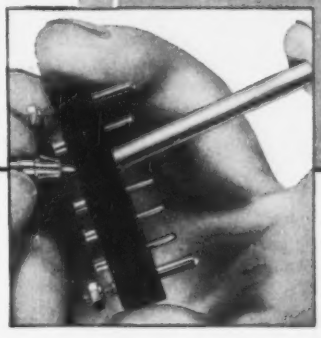
Where electrical connector requirements are strict, or the job specialized, take advantage of Breeze experience. Breeze has engineered such advantages as removable contacts for panel-type connectors. This exclusive feature greatly simplifies wiring and maintenance, and is typical of advanced Breeze design.



PRESSURE-SEALED
OR WATER-TIGHT CONNECTORS



Engineered to specification in aluminum, brass, or steel. All sizes, capacities. High voltage pulse type connectors. Also rotary shaft seals and allied equipment. Write for details.



BREEZE "Monobloc Miniatures" (above) come in 5, 10, 15, and 20 contact sizes or multiples thereof. Capacity—10 amperes with 7 millivolt drop; 500 volts DC or 275 volts AC.

REMOVABLE CONTACTS

Save Time, Trouble, Confusion

Simple tool (right) removes contacts for bench soldering. Production time reduced, close work eliminated, errors avoided. Contacts simply snap back into block.

Contact retained securely in block by two spring locks.

Tubular tool inserted from contact side to close springs.

Contact easily removed, but cannot come loose in service.

LOOK TO THE BREEZE MARK FOR QUALITY

Other Breeze Precision Products

ACTUATORS: All types, sizes. Complete control systems engineered to requirements. Above: Landing gear actuator, Fairchild Packet.

RADIO SHIELDING: For any type of high or low tension system. New type "unit leads" or re-wirable leads. Flexible shielded conduit.

"AERO-SEAL" Worm-Drive Hose Clamps. Vibration proof, uniform clamping, use again and again. Cadmium plated or stainless steel.

BREEZE

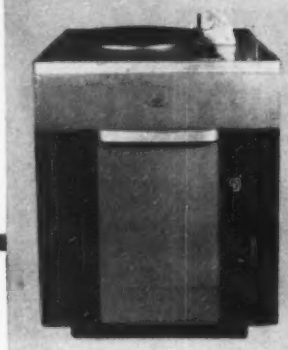
CORPORATIONS, INC.

41-E South Sixth Street Newark 7, New Jersey

the finest instruments
.that's why the nation's best engineers.

PRESTO Recording Amplifier 92-B

One of the most popular rack mounting recording amplifiers available. Push-button switch for selecting recording characteristics. Front panel is removable giving complete access to circuits, resistors, capacitors. Frequency response: 20 to 17,000 cps. Ample undistorted power, 60 watts. Gain: 83 db.



PRESTO Transcription Turntable 64-A

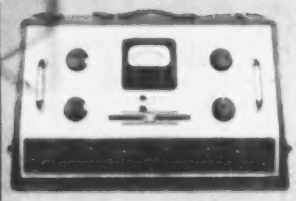
Preferred by broadcasters because it operates for long periods of time with no maintenance or adjustments. Direct gear drive from dual motors at 78 and 33⅓ rpm. Full speed is reached within ⅛ revolution, making it ideal for quick cuing. Low mechanical disturbance, maximum speed accuracy.

PRESTO Portable Disc Recorder 6-N

One of the most widely used recorders of its type in the world. Often used with the 90-B for portable work, yet its high-quality construction makes it an excellent studio recorder. Equipped with Presto 1-D recording head, it is available with or without carrying case. Frequency response of cutting head: 50 to 10,000 cps. Cutting speeds 78 and 33⅓ rpm. Microgroove available at additional cost.

PRESTO Console Disc Recorder 66-G

This high-quality disc machine features the famous Presto dual motor gear drive, allowing perfect program timing and synchronization with film equipment. Equipped with a 1-D cutting head, the frequency range of the 66-G is 50 to 10,000 cps. Two speeds, 78 and 33⅓ rpm. with microgroove pitch available at slight additional cost. Recommended for use with 92-B rack mounted amplifier. Low in cost, this Presto model is ideal for small stations or recording studios.



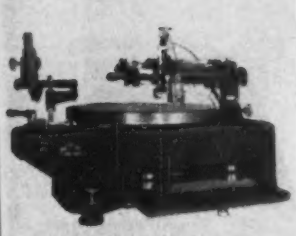
PRESTO Portable Recording Amplifier 90-B

The perfect recording amplifier for remote assignments with the advantages of high fidelity studio performance. The 90-B has three preamplifiers, mixer, master gain control and recording amplifier. Five position selector switch for various characteristics. Frequency response: 30 to 15,000 cps. Noise: 55 db below recording level. Illuminated VU meter.

IN THE PRESTO DISC PLANT Flawless, highly polished aluminum blanks start on their 1½ hour trip through the 550 foot processing tunnel, where they are automatically coated with the finest recording lacquer. After additional weeks of "curing" in the air-conditioned, dust-free Presto plant, these discs are sealed and shipped throughout the world . . . wherever quality recording is done.

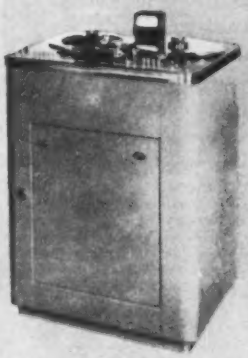
THE PRESTO RECORDER is one of the most widely read publications in the recording field. Every month this little newspaper covers subjects of interest to broadcasters, educators, recording companies . . . anyone engaged in the business of recording. Your name will be placed on the free distribution list by writing to: Editor, Presto Recorder, Box 500 Hackensack, New Jersey.

give lasting satisfaction
consistently choose PRESTO equipment



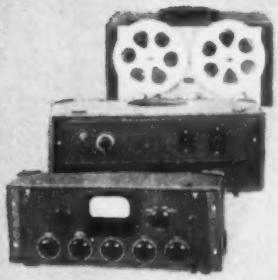
PRESTO Precision Disc Recorder 8 D-G

Custom-built to the highest disc recorder specifications. Designed for unusual flexibility and easy manipulation. Dual motor, direct gear drive at 78 and 33⅓ rpm. 1-D cutting head has response of 50 to 10,000 cps. Cantilever type overhead does not contact disc or turntable. Heavy, vibrationless base is adjustable for absolute level.



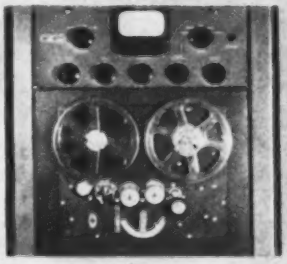
PRESTO Studio Tape Recorder SR-950

Regardless of price, there is no finer tape machine available than the SR-950. A precision recorder in every sense of the word . . . three motors . . . separate heads for recording, playback and erasing . . . operation by push button control. Frequency response: 30 to 15,000 cps. Records 1 hour at 15"/sec; two hours at 7½"/sec. All parts instantly accessible by unique cabinet design.



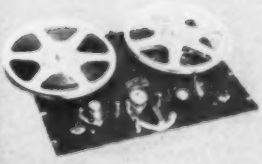
PRESTO Portable Tape Recorder PT-900

Engineers everywhere have approved this compact little machine. Easily portable in two durable cases, the PT-900 sets up into a complete broadcast-quality machine. Three heads . . . erase, record, playback. Separate recording and monitoring amplifiers. Three microphone input. Available in either 15" and 7½"/sec or 7½" and 3¾"/sec. By far the most features and best construction in its class.



PRESTO Tape Recorder RC-10

A brand new Presto tape recorder for relay rack mounting. Will use reels up to 10½" diameter. Separate heads for recording, playback and erasing. Three-motor drive mechanism with speeds of 15" & 7½"/sec or 7½" & 3¾"/sec. Frequency response to 15,000 cps. Amplifier recommended: 900-A1 (basic amplifier used in the PT-900 tape recorder).



PRESTO Tape Playback PB-10

Another new Presto tape machine, designed for rack mounting, employing many valuable features of the SR-950 recorder. Mechanism is identical to the RC-10, except this machine has a reproducing head only. Will playback reels up to 10½" diameter without typing up your tape recorder. Moderately priced, the PB-10 can be used with any amplifier having sufficient gain, with addition of bass boost.

WORLD'S LARGEST MANUFACTURER OF PRECISION RECORDING EQUIPMENT AND DISCS

PRESTO
RECORDING CORPORATION
Paramus, New Jersey

IN CANADA: Walter P. Downs, Ltd., Dominion Square Bldg., Montreal OVERSEAS: M. Simons Company, Inc., 25 Warren Street, New York City, N. Y.

BALLANTINE ELECTRONIC VOLTMETERS

The INDICATING METER used on all BALLANTINE VOLTMETERS features a single logarithmic voltage scale and uniform decibel scale. Makes readings especially easy. Accuracy of indication is 2% at any point on the scale.

MODEL 300
ELECTRONIC VOLTMETER

For the precise measurement of AC voltages from 1 millivolt to 100 volts over a frequency range of 10 cycles to 150,000 cycles. Accuracy of voltage readings is within 2%. Output jack and output control provided so that instrument can be used as highly stable amplifier, with 70 DB gain, flat within 2% over entire frequency range. Input impedance is ½ megohm. Special circuits insure permanent and highly accurate calibration, not affected by variation in line voltage or tube replacement. A high quality instrument for laboratory use—note the several accessories listed below which further increase utility of voltmeter.

MODEL 304
R.F. VOLTMETER

This instrument measures AC voltages over a range of 1 millivolt to 100 volts from 30 cycles to 5.5 megacycles. Probe type input connector attached by a flexible cable provides true indication of voltages at point of origin in circuits. Accuracy of voltmeter readings are within 5%. Input impedance is 1 megohm shunted by 9 mmfds. Can be used as wide-band amplifier. Especially useful for reading millivolts in television and FM intermediate frequency amplifier circuits, RF heating apparatus, carrier current systems and in particular for extending useful frequency range of ordinary oscilloscopes to beyond 5 megacycles.

MODEL 302-B
PORTABLE ELECTRONIC VOLTMETER

This Electronic Voltmeter is portable and operates from lightweight batteries contained within carrying case. Reads AC voltages from 100 microvolts to 100 volts over frequency range of 2 cycles to 150,000 cycles. Accuracy 2% at any point on scale. Can be used as highly stable amplifier. Input impedance 2.2 megohms. Especially useful for making measurements on ungrounded or symmetrical circuits. Uses standard Eveready or Burgess batteries. Battery life over 150 hours.

MODEL 402A (x10) and
MODEL 402B (x100) MULTIPLIERS

Accessories for use with Models 300 and 302 Voltmeters. Model 402A extends upper range of voltmeters from 100 to 1,000 volts. Also increases input impedance of voltmeters to 4 megohms.

Model 402B extends upper range of voltmeters from 100 to 10,000 volts. Also increases input impedance of voltmeters to 40 megohms.

MODEL 305
PEAK TO PEAK ELECTRONIC VOLTMETER

The outstanding characteristic of this instrument is its ability to provide absolute indication of transient or pulse voltages of short duration. Reliable indication of pulses a few microseconds wide repeated only 10 times per second is readily obtained with this instrument. The Voltmeter is pre-calibrated, compact, easy to operate and observe. Positive and negative peaks are registered over the range of .001 volt to 1,000 volts, peak to peak. Decade ranges and a logarithmic scale output meter are characteristic features, along with a separately available high gain, wide-band amplifier.

MODEL 310
SENSITIVE ELECTRONIC VOLTMETER

This Electronic Voltmeter measures AC voltages from 100 microvolts to 100 volts in six decade steps over a frequency range of 10 cycles to 2 megacycles. The accuracy of voltage readings is within 3% from 10 cycles to 500,000 cycles and within 5% from 10 cycles to 2 megacycles. The input impedance is 2.2 megohms shunted by 15 mmfd on the .001 and .01 volt ranges and 2.2 megohms shunted by 8 mmfd on the other decade ranges. The voltmeter can be used as a highly stable amplifier, with 66 DB gain.

TECHNICAL BULLETIN IS AVAILABLE COMPLETELY DESCRIBING ABOVE INSTRUMENTS

BALLANTINE LABORATORIES, INC.
BOONTON, NEW JERSEY, U. S. A.

Specify "MAKEPEACE"

With nearly sixty years experience in the production of both laminated and solid precious metals, MAKEPEACE is today an accepted "headquarters" for the many special precious metal products and assemblies called for in the electronic field.

FOR RINGS AND WAVE GUIDE TUBING in laminated precious metals

Silver or gold, or platinum, or palladium, or their alloys, are bonded to the required base metal, such as copper or bronze alloys, to produce the required operating characteristics at real savings in cost over solid precious metals.

Today, rings are used in special electric motors, calculators and computators, radar, fire control instruments, potentiometers and many other electro-mechanical devices.

Laminated tubing is increasingly called for in the new higher frequency R. F. plumbing . . . for wave guides . . . and for coaxial line segments.

MAKEPEACE maintains a fully equipped research and testing laboratory . . . as well as a staff of thoroughly experienced metallurgists, chemists and consultants . . . all at your service.

Your inquiries are cordially invited and will receive our prompt and interested attention.

D. E. MAKEPEACE COMPANY

Laminated and Solid Precious Metals for Industrial Use • Fabricated Parts and Assemblies • Bar Contact Material • Precious Metal Solders

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CHICAGO OFFICE, 55 EAST WASHINGTON STREET

ALLIED'S RELAY GUIDE

	ALLIED TYPE	MAXIMUM CONTACT ARRANGEMENT	CONTACT RATING CURRENT NON-INDUCTIVE AT 24 V DC AND 110 V AC	COIL OPERATION	COIL DATA IN VOLT-AMPERES OR WATTS AC DC MINIMUM	RATED	MAXIMUM	MAX. D.C. OHMS OF STANDARD COILS	MAX. RATED VOLTS OF STANDARD COILS	DIMENSIONS HEIGHT	WIDTH	LENGTH	WEIGHT IN OUNCES	ADDITIONAL FEATURES AS NOTED AT LEFT
1	AH	D.P.D.T.	5	AC	5.2	6.5	10.5	1380	230	1-3/8	1-19/32	2-3/8	3-1/2	
				DC	0.15	1.0	5.0	8000	90					
2	AS	S.P.D.T.	5	AC	2.5	3.5	5.0	3500	230	1-3/16	15/16	1-5/8	2	3
				DC	0.5	1.0	4.6	3485	60					
3	B	S.P.D.T.	1	AC	0.09	0.12	9.5	12000	110	1-3/4	2-3/8	2-3/4	7	2
				DC	0.009	0.012	4.9	12000	12					
4	BK	D.P.D.T.	1	AC	.190	.24	9.5	12000	150	1-21/32	2-5/8	2-5/8	7	2
				DC	.019	.024	4.9	12000	18					
5	BG	S.P.D.T.	2	DC	.011	.05	4.8	5000	16	1-1/4	1-3/4	1-3/8	2-3/4	3
6	BJ	D.P.D.T.	5	AC	2.8	3.5	7.3	3370	220	1-9/16	25/32	2-5/16	2-1/4	1, 2, 3, 7
				DC	1.0	2.0	5.5	3370	82					
7	BJU	ELECT. LATCH 4.P.D.T.	5	AC	3.6	9.0		3370	220	1-15/16	1-7/8	1-9/16	6-1/2	6
				DC	2.8	3.5		3370	110					
8	BN	6.P.D.T.	10	DC	1.5	3.5	8.0	4460	125	2-9/16	3	1-23/32	11	2, 7
9	BO	D.P.D.T.	15	AC	3.6	4.5	10.0	2675	250	1-7/8	1-13/32	1-5/8	4	2, 3, 7
				DC	1.5	2.5	5.7	5000	112					
10	BOY	D.P.D.T.	15	DC	.50	.75	7.2	10000	87	1-7/8	1-13/32	1-5/8	5	2, 3, 7
11	CN	S.P.S.T. N.O. OR N.C.	50	AC	7.2	9.0	14.0	700	230	2-1/2	2	2-1/4	9-1/4	
				DC	1.0	3.5	8.5	4460	125					
12	DS	DIFFERENTIAL D.P.D.T.	5	DC	.04	.05	5.0	8000		1-13/16	1-3/16	2-3/8	7	3
13	E	S.P.D.T.	1	DC	0.5	.75	3.0	3100	55	15/16	1-1/16	1-1/16	1	
14	FID	S.P.S.T.	2	DC	.08	.20	4.5	4900	31	1-3/8	1-3/16	1-3/8	2	
15	SW	S.P.D.T. D.P.D.T.	2.5	DC	.003 .012	.012 .050	4.25	13800	230	1-7/16	1-1/16	1-19/32	2.5	2,3
16	HRX	3.P.D.T.	15	AC	5.2	6.5	12.0	1800	230	1-1/2	2-11/16	1-5/8	6-3/4	8
				DC	1.5	3.0	7.0	4420	115					
17	PO	3 & 4.P.D.T.	15	AC	8.0	10.0	17.2	870	230	2-1/4	3.P.D.T. 1-5/8	1-7/8	7	2, 3, 7
				DC	1.0	2.5	8.2	5000	112					
18	POY	3 & 4.P.D.T.	15	DC	0.6	1.0	8.0	10000	110	2-1/4	4.P.D.T. 2-3/16	1-7/8	7	2, 3, 7
19	RA	CO-AXIAL S.P.D.T.	1.25 R.F.	DC	0.5	1.5	5.0	2000	55	2	2-7/8	1-3/4	4	4,10
20	SK-C-C	D.P.D.T.	1	DC	.340	2.5	4.2	4500	110	1-5/16	31/32	1-7/16	2.0	1, 3, 5
21	SK-CC-C	3.P.D.T.	1	DC	.545	2.5	4.2	4500	110	1-1/2	31/32	1-7/16	2.1	3
22	SK-CC-CC	4.P.D.T.	1	DC	.755	2.5	4.2	4500	110	1-1/2	31/32	1-7/16	2.5	3
23	TSL	D.P.D.T.	1	DC	0.5	1.0	5.0	2000	55	1-9/16	1-3/16	11/16	1	1, 5
24	PR	4.P.D.T.	10	AC	4.8	6.0	13.0	620	220	2-1/16	1-7/8	1-1/8	5	3, 7
				DC	1.0	2.5	7.5	5700	110					
25	LK	6.P.D.T.	2	DC	.040	.65	7.0	5200	110	1-5/8	1-3/32	2-7/32	4	1,3
26	SKH	Hermetically sealed relay — data same as SK												
27	BOHO	Hermetically sealed relay — data same as BO												

ADDITIONAL FEATURES

1. Available with Standard Ceramic Insulation.
2. Available with bakelite base and screw terminals.
3. Available hermetically sealed.
4. Available with auxiliary contacts.
5. Available for low capacity.
6. For intermittent operation only.
7. Available in double-break contact arrangement.
8. Available with ceramic insulation only.
9. Listed by Underwriters' Laboratories, Inc.
10. Designed to handle a maximum of 75 watts of radio frequency up to 150 megacycles when inserted in a properly terminated 52 ohm line.

NOTE 1.
Minimum coil data applies where shock and vibration are not a factor.

NOTE 2.
Maximum coil data based on 85° C rise above 20° C ambient for continuous operation except for mercury type relay which are based on 65° C ambient.

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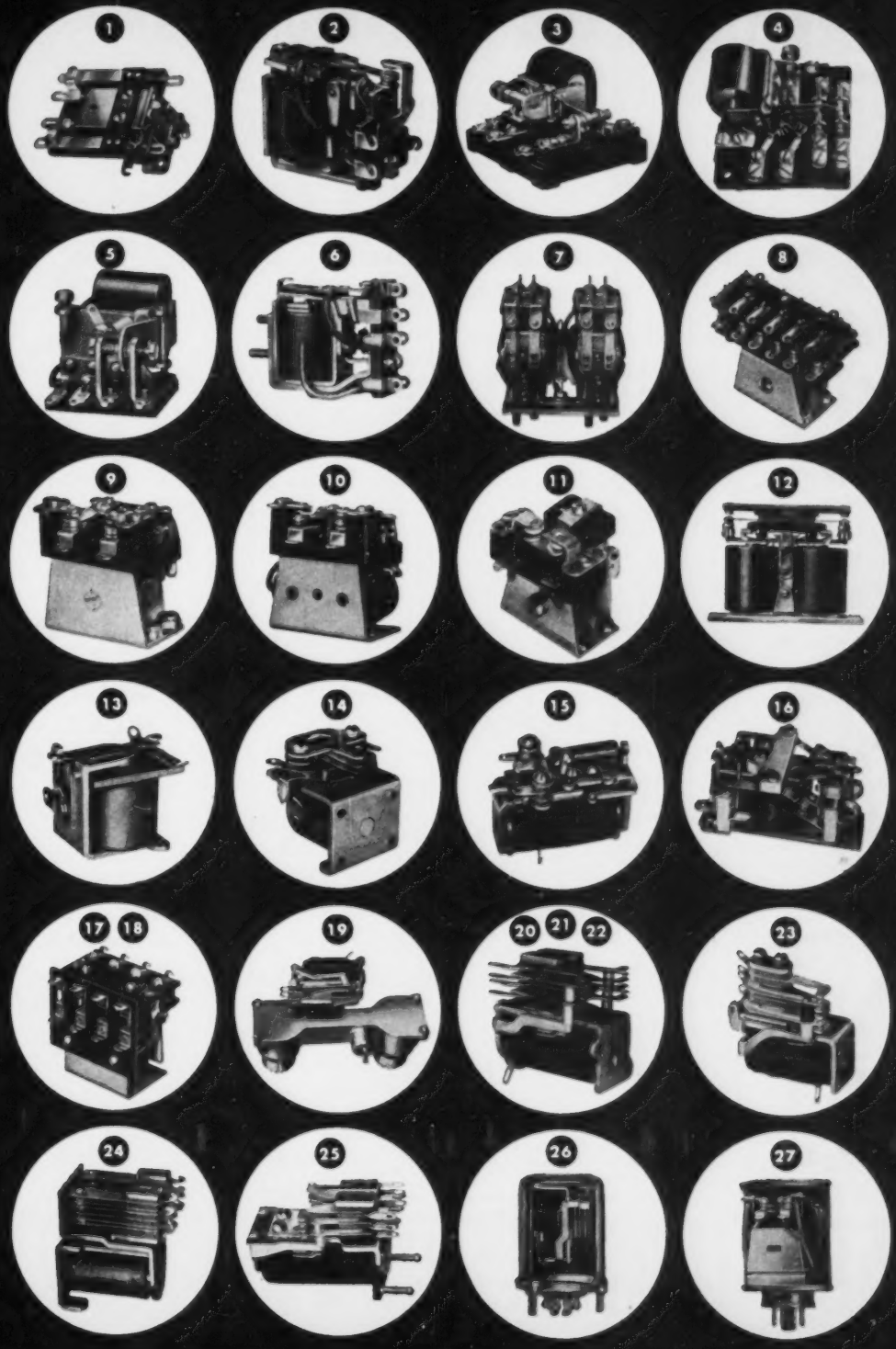

ALLIED CONTROL CO., INC., 2 EAST END AVENUE, NEW YORK 21, N. Y.

RECTIFIER AND THYRATRON TUBES

HALF-WAVE RECTIFIERS

1. NL-614

2. NL-615

3. NL-617

4. NL-618 • NL-618P

5. NL-623

6. NL-625 & NL-627

7. NL-635

8. NL-649/5834/249R

QUICK-HEATING INDUSTRIAL TYPES

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Longest Life—
Longest Warranties
in the Industry

Illus. No.	Type Number	Gas Filling	DC Output Amps.	Peak Amps. Rating	Peak Inverse Volts	Filament Volts & Amps.
		HALF-WAVE RECTIFIERS				
1	NL-614	Xenon	2.5	15	900	2.5v 8.5a
2	NL-615	Mercury	2.5	10	2000	2.5v 7a
3	NL-617	Mercury	5.0	20	1000	2. v 12a
4	NL-618	Xenon	6.4	40	750	2.5v 18a
5	NL-623	Mercury	15	45	500	2.5v 20a
6	NL-625	Mercury	15	45	900	2.5v 20a
6	NL-627	Mercury	20	120	1000	2.5v 26a
7	NL-635	Mercury	6.4	40	1000	2.5v 18a
8	NL-649 5834/249R	Mercury	2	10	900	2.5v 7a
		THYRATRONS				
9	3C23 & 323B & 393A	Argon & Mercury	1.5	6	1250	2.5v 7a
10	NL-710	Argon & Mercury	2.5	30	1250	2.5v 9a
11	NL-714	Argon & Mercury	1	3	1250	2.5v 5a
11	NL-715/FG-17/5557	Mercury	1	3	5000	2.5v 5a
11	NL-740	Argon & Mercury	4	50	1250	2.5v 16a
11	NL-741	Mercury	4	50	5000	2.5v 16a
		FULL WAVE RECTIFIERS				
	NL-600	Argon & Mercury	1	4	900	2.5v 6a
13	NL-604	Argon & Mercury	2.5	10	900	2.5v 12a

THYRATRONS

9. 3C23 323B 393A

10. NL-710

11. NL-714 & 715/FG-17/5557

12. NL-740 NL-741

FULL-WAVE RECTIFIERS

13. NL-604

NATIONAL TUBES
are produced by
Industrial Tube
specialists,
exclusively

Quick Heating — most types require 5 to 30 seconds.

Long Life — full 1 year operating warranty.

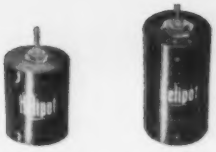
WRITE FOR TECHNICAL DATA BOOK

NATIONAL ELECTRONICS, INC.
GENEVA, ILLINOIS, U. S. A.

In this panel are illustrated standard models of HELIPOT multi-turn and single-turn precision potentiometers—available in a wide range of resistances and accuracies to fulfill the needs of nearly any potentiometer application. The Beckman DUODIAL is furnished in two designs and four turns-ratios, to add to the usefulness of the HELIPOT by permitting easy and rapid reading or adjustment.

A B C

MODELS A, B, & C HELIPOTS
A—10 turns, 46° coil, 1-13/16" dia., 5 watts—resistances from 10 to 300,000 ohms.
B—15 turns, 140° coil, 3-5/16" dia., 10 watts—resistances from 50 to 300,000 ohms.
C—3 turns, 13-1/2° coil, 1-13/16" dia., 3 watts—resistances from 5 to 50,000 ohms.



D E

MODELS D AND E HELIPOTS
Provide extreme accuracy of control and adjustment, with 9,000 and 14,400 degrees of shaft rotation.
D—25 turns, 234° coil, 3-5/16" dia., 15 watts—resistances from 100 to 750,000 ohms.
E—40 turns, 373° coil, 3-5/16" dia., 20 watts—resistances from 200 ohms to one megohm.

F G

MODELS F AND G PRECISION SINGLE-TURN POTENTIOMETERS
Feature both continuous and limited mechanical rotation, with maximum effective electrical rotation. Versatility of designs permit a wide variety of special features.
F—3-5/16" dia., 5 watts, electrical rotation 359°—resistances 10 to 100,000 ohms.
G—1-5/16" dia., 2 watts, electrical rotation 356°—resistances 5 to 20,000 ohms.

LABORATORY MODEL HELIPOT
The ideal resistance unit for use in laboratory and experimental applications. Also helpful in calibrating and checking test equipment. Combines high accuracy and wide range of 10-turn HELIPOT with precision adjustability of DUODIAL. Available in eight stock resistance values from 100 to 100,000 ohms, and other values on special order.

R W

MODELS R AND W DUODIALS
Each model available in standard turns ratios of 10, 15, 25 and 40 to 1. Inner scale indicates angular position of HELIPOT sliding contact, and outer scale the helical turn on which it is located. Can be driven from knob or shaft end.
R—2" diameter, exclusive of index.
W—4-3/4" diameter, exclusive of index. Features finger hole in knob to speed rotation.

FOR PRECISION POTENTIOMETERS come to Helipot

For many years The HELIPOT Corporation has been a leader in the development of advanced types of potentiometers. It pioneered the *helical* potentiometer—the potentiometer now so widely used in computer circuits, radar equipment, aviation devices and other military and industrial applications. It pioneered the DUODIAL®—the turns-indicating dial that greatly simplifies the control of multiple-turn potentiometers and other similar devices. And it has also pioneered in the development of many other unique potentiometric advancements where highest skill coupled with ability to mass-produce to close tolerances have been imperative.

In order to meet rigid government specifications on these developments—and at the same time produce them economically—HELIPOT® has perfected unique manufacturing facilities, including high speed machines capable of winding extreme lengths of resistance elements employing wire even less than .001" diameter. These winding machines are further supplemented by special testing facilities and potentiometer "know-how" unsurpassed in the industry.

So if you have a problem requiring *precision potentiometers* your best bet is to bring it to The HELIPOT Corporation. A call or letter outlining your problem will receive immediate attention!

**Trade Marks Registered*

The versatility of the potentiometer designs illustrated above permit a wide variety of modifications and features, including double shaft extensions, ganged assemblies, the addition of a multiplicity of taps, variation of both electrical and mechanical rotation, special shafts and mounting bushings, high and low temperature operation, and close tolerances on both resistance and linearity. Examples of potentiometers modified for unusual applications are pictured at right.

A C

3-GANGED MODEL A HELIPOT AND DOUBLE SHAFT MODEL C HELIPOT
All HELIPOTS, and the Model F Potentiometer, can be furnished with shaft extensions and mounting bushings at each end to facilitate coupling to other equipment.
The Model F, and the A, B, and C HELIPOTS are available in multiple assemblies, ganged at the factory on common shafts, for the control of associated circuits.

B F

MULTITAPPED MODEL B HELIPOT AND 6-GANGED TAPPED MODEL F
This Model B Helipot contains 40 taps, placed as required at specified points on coil. The Six-Gang Model F Potentiometer contains 19 additional taps on the middle two sections. Such taps permit use of padding resistors to create desired non-linear potentiometer functions, with advantage of flexibility, in that curves can be altered as required.

THE Helipot CORPORATION, SOUTH PASADENA 7, CALIFORNIA

IF IT'S ABOUT TIME

Timing Ideas

WHEN TIMING COUNTS

You can always count on Haydon to provide the right motor for your timing job. Timing Headquarters offers a broad line of efficient, economical timing motors and timers produced by specialists who have no other interest than to provide the best in timing.

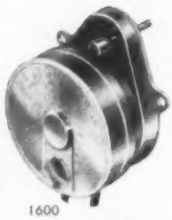
LOW COST VERSATILITY—1600 SERIES: Specifically designed as a standard component for the widest possible range of timing applications with 79 speeds from 300 rpm to 1 revolution per 4 hours.

COMPACTNESS AND SLOW SPEED—4400 SERIES: Designed for small size and low cost in applications requiring slower speeds from 6 hours to 7 days per revolution.

HEAVY DUTY DEPENDABILITY—3100 SERIES: For control and instrument applications that require a heavy duty train and speeds from 1 hour to 14 days per revolution.

SUPERIORITY FEATURES

Slow (450 rpm) rotor speed makes for quiet operation and long life. Unusually small. All motors totally enclosed. Separate rotor and reduction gearing lubricating systems permit selection of best methods and lubricants, control circulation, insure against leakage. Operates continuously in any position. Simple to mount, entire face of motor can be supported securely against mounting surface. Standard, interchangeable design in only 2 motor series with speed range from 300 rpm to 1 revolution in 7 days.



1600

4400

3100

For complete design and engineering specifications, write for catalog: Timing Motors No. 322 — Timers No. 323 — Clock Movements No. 324. Yours without obligation.

Illustrated here are just a few of the many timing motors and timing devices we've designed and produced to solve the timing problems of our customers. Whether you can use a standard model — or whether you'll need a special design — you'll find that, in the long run, it'll pay to see Haydon* first.

STANDARD SPECIFICATIONS

Available for any size order; normally stocked in limited quantities.

THE 1600 SERIES

SPEEDS: 1/60, 1/45, 1/30, 1/15, 1/10, 1/6, 1/5, 1/4, 1/3, 1/2, 1, 2, 4, 5, 10, 30, 60 rpm

VOLTAGES: 115 standard; 230 to order

FREQUENCIES: 60 cps standard; 50 and 25 cps to order

ROTATION: Right (clockwise) standard; left (counter-clockwise) to order

SHAFT: 1/8" diameter x 3/8" long

WATTS INPUT (115V, 60 cps): 2.5

LEADS: 6", stripped 1/2"

TORQUE: 5 ounce inches @ 1 rpm (60 cps, 2.5 w); maximum torque load for standard gear train: 20 ounce inches

THE 4400 SERIES

SPEEDS: 6, 8, 12 hours and 1 or 7 days per revolution

VOLTAGES: 115 standard; 230 to order

FREQUENCIES: 60 cps standard; 50 and 25 cps to order

ROTATION: Right (clockwise) standard; left (counter-clockwise) to order

SHAFT: 1/8" diameter x 3/8" long

WATTS INPUT (115V, 60 cps): 2.5

LEADS: 6", stripped 1/2"

TORQUE: 20 ounce inches at all speeds, which is maximum torque load for standard gear train

THE 3100 SERIES

SPEEDS: 1, 12 hours, 1, 7, 14 days per revolution

VOLTAGES: 115 standard; 230 to order

FREQUENCIES: 60 cps standard; 50 and 25 cps to order

ROTATION: Left (counter-clockwise) standard; right (clockwise) to order

SHAFT: 3/16" diameter x 3/8" long, with .162 diameter flat

WATTS INPUT (115V, 60 cps): 2.5

LEADS: 12", stripped 1/2"

TORQUE: 15 pound inches at all standard speeds, which is maximum torque load for standard gear train

Many additional speeds and shafts available in quantities of 100 or more; also special voltage-frequency combinations.

*Trade Mark Reg. U. S. Pat. Off.

HAYDON AT TORRINGTON

HEADQUARTERS FOR TIMING

HAYDON Manufacturing Co., Inc.

500 ELM STREET

TORRINGTON, CONNECTICUT

SUBSIDIARY OF **GENERAL TIME** CORPORATION

...IT'S TIME TO SEE

HAYDON....

Some of our customers incorporate Haydon Timing Motors into their products. Others ask us to give them timing devices — in many cases devices especially designed for their application. Whatever your need may be, Haydon timing experience and facilities are at your disposal. Feel free to call on Haydon whenever you have a timing problem.

STANDARD SPECIFICATIONS

SERIES 8006 INTERVAL TIMER

Standard models for intervals of 1, 15, 60 and 180 minutes; dial and knob optional • Other models for intervals up to 24 hours or more available without dial or knob • HOLD feature optional • Switch rated 28A, 250 VAC; 1 HP 250 VAC • Removable dust cover for timer; motor totally enclosed • Settable in either direction, to start or when operating • Withstands high temperature and humidity conditions • U.L. Approved.

SERIES 8010 INTERVAL TIMER WITH BUZZER

Many intervals available with a wide range of motor speeds • Optional buzzer for audible signal at completion of cycle; sounds until turned off • Load contact ratings: 16A, 250 VAC; 1/2 HP, 250 VAC • Compact: 3-53/64" x 2-55/64" x 1-25/32" • Operates in any mounting position • U.L. Approved.

SERIES 5900 TIME DELAY RELAY

5901 Series adjustable time delay relays are available in delays of 15 seconds, 1, 10 and 5 minutes. 5902 Series, non-adjustable, available in delays of 12, 15, 30, 45 and 48 seconds and 1, 2, 3, 3-3/4, 4, 5, 6, 7-1/2, 8 and 10 minutes.

SERIES 5700 ELAPSED TIME INDICATORS

5701 and 02 Series are non-reset indicators, available for time registers of hours and tenths, hours, minutes and tenths, and minutes; total registers for 9,999.9 hours or minutes or 99,999.0 hours or minutes. 5704 and 07 Series are resettable units, with time registers for hours and tenths, hours, minutes and tenths, and minutes; total registers for 9,999.9 hours or minutes or 99,999.0 hours or minutes.

Timing Ideas

PRECISION PERFORMANCE

Manufacturers, recognizing that components of quality insure outstanding product performance, look to Haydon® at Torrington for timers and timing devices. All Haydon timers are made with the same precision as the Haydon motor — your guarantee of satisfactory performance. If you need a special design, you'll find Haydon's extensive engineering and development facilities without equal for service and results.

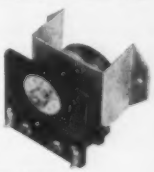
A few examples of basic Haydon timing units are featured below.

SERIES 8010 INTERVAL TIMER WITH BUZZER

Compact, low cost timer for volume production. Wide range of intervals. Audible (buzzer) signal optional. Quick break. Load contact rated 10A, ½ HP 250 VAC.

SERIES 8006 INTERVAL TIMER

Designed for heavy duty, this unit is available in quantities in standard models. Wide range of intervals. HOLD feature optional. Quick break. Totally enclosed. Switch rated 28A, 1 HP 250 VAC.



SERIES 5900 TIME DELAY RELAY

For use where positive, accurate time delay relay is imperative. Automatic reset. Fixed models for volume production; adjustable models in 4 delay ranges for general use.

SERIES 5700 ELAPSED TIME INDICATOR

Synchronous timing motors with cyclometer type counters for metering elapsed time. Rugged models for wide range of timing, recording operations; in several registers, resettable or non-resettable.

® TRADE MARK REG. U.S. PAT. OFF.

For complete design and engineering specifications, write for catalog: Timing Motors No. 322 — Timers No. 323 — Clock Movements No. 324. Yours without obligatin.

HAYDON Manufacturing Co., Inc.
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TORRINGTON, CONNECTICUT
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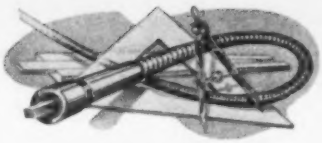

MODERN DESIGN AND ENGINEERING

Many an industry owes much of the success of its products to the modern solution of its angular drive problems with flexible shafting. The right application of a flexible shaft can mean greater flexibility in alignment . . . better integration of units . . . less complex gearing.

The result is lower assembly costs and a product that is quiet, smooth, efficient and trouble-free in operation with minimum repair requirements. Circle Ess flexible shafts will stand the most rigid tests and scrutiny. They will help to solve your problems as they have those of many other manufacturers.

Write for our new book "Flexible Shaft Assemblies."

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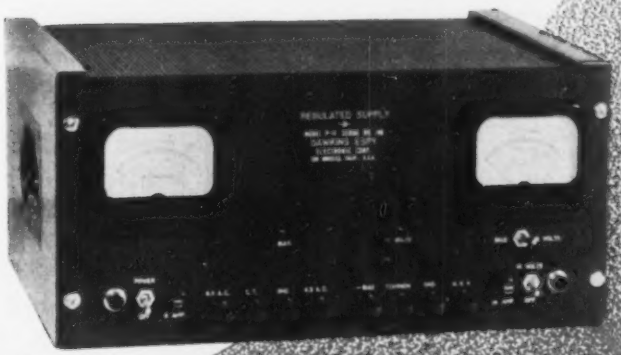
— —*THE* Variable Regulated Power Supply



D Espy Model P-11

Voltages *stay put* when D. Espy supplies are used, even under wide line and load variations. That means dollars and cents to you, for it gives you control over test variables — saves *valuable engineering time.* And you have a versatile instrument that's equally good for precision applications or general laboratory use. Check the specs; then order for *your* lab.

MODEL P-11—

- 0 to +400 v.d-c, 200 ma.
- Regulation within 0.1 volt
- Continuously variable
- Hum less than 10 mv.
- 0 to −150 v.d-c for bias
- 6.3 v.a-c, 6 amperes
- Metered output
- Voltages front and rear
- Voltage connections isolated from chassis ground
- SLO-DOWN circuit prevents initial voltage surge at terminals
- Line and hi-voltage fuses on panel
- Rack type panel, with cabinet
- 105/125 v. 50/60 cps source
- $350.00, f.o.b. Los Angeles

MODEL P-12—

- 0 to +600 v.d-c, 300 ma.
- Other features same as P-11
- Heavy duty construction
- $475.00, f.o.b. Los Angeles

MODEL P-14—

- +200 to +1000 v.d-c, 500 ma.
- Regulation better than 0.5%
- Hum less than 20 mv.
- Other features same as P-11
- $650.00, f.o.b. Los Angeles

All power supplies complete with cabinet and tubes.

Price subject to change without notice.

CUSTOM POWER SUPPLIES

We specialize in custom-built regulated power supplies. If you have a powering problem for applications such as magnetron, Klystron, X-ray, television, or wide-band transient response amplifiers, let our engineers help you work it out.

DAWKINS ESPY ELECTRONIC CORP.

11747 W. Pico Blvd. Los Angeles 34, Calif.

ESICO

REG. U. S. PAT. OFF.

• Red Label Irons

These are the irons that are used so universally in factory production lines. They are light weight, finely balanced, and have the coolest handles of any irons on the market. Elements are mounted and held in place with a knurled nut which engages the back end of the element and seats against the shoulder of the case shell, holding the element firmly in place regardless of the most rugged use. They are ideal from a maintenance standpoint for, due to their two piece combination terminal and handle, elements are replaceable in three minutes or less. The only iron on the market designed for use with or without a ground wire.

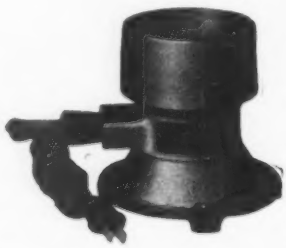
Irons are normally supplied in four wattages. They are obtainable, when required in quantity, in special wattages at no extra cost. Standard voltages are 105-120 and 220-240. Special voltages may be had. List prices of irons are as follows: No. 38-100 watt $6.95, No. 58-200 watt $8.95, No. 78-300 watt $10.95 and No. 98-550 watt $12.95. The iron illustrated is the No. 38 and is ½ actual size.

• No. 61 Pencil Iron

This pencil iron is only seven inches in length and weighs just 2½ ounces exclusive of cord. The handle temperature at the point where it is held in the fingers, is actually no higher than body temperature. Diameter of handle is ¾" and may be used as a pencil for the most delicate soldering operations. The element construction is of the same type as used in ESICO industrial irons and will give long service. The tip is the so called plug type, held in place with a set screw. Three shapes of tips are available, Type B – ⅛" dia. pyramid point, Type A – ⅛" dia. straight pencil point and Type C – ⅛" dia. bent 90 degrees with a pencil point.

The No. 61 is regularly wound to 25 watts at 105-120 volts, but may be had in higher wattages, when required in quantities at no extra cost. List price of iron is $4.95. Tips A, B, or C 30¢ each list. Irons are available thru any of the better tool or Radio & Electronic Supply houses. If your distributor can not supply you from stock, send your order direct to us, but please be sure and give name of your distributor.

• Solder Pots



Ruggedly constructed cast iron pots, with easily replaceable elements.

Model No. 12 ¾ lb cap. 200 watt
Net **$4.50**

Model No. 36 7½ lbs cap. 250 watt
Net **$5.50**

Model No. 60 3½ lbs cap. 325 watt
Net **$6.50**

• Temperature Control Stand

This control stand is thermostatically actuated by the tip temperature of the iron. This is the only logical way to control the temperature of a soldering iron, for there is too much lag between element and tip temperature for the application of a thermostat to the element, whether in an iron or a control stand. Cat. No. 5, irons up to ⅛" dia. tip. Cat. No. 6, irons ⅛" to 11/64" dia. tips. List price **$6.30.**

ELECTRIC SOLDERING IRON CO., Inc.

3850 West Elm Street — **Deep River, Conn., U. S. A.**

Hold on to this book

It will be June 1951 before another edition is published

IT IS THE MOST COMPLETE, AUTHORITATIVE AND UP-TO-DATE DIRECTORY OF ELECTRONIC AND ALLIED PRODUCTS AVAILABLE.

It gives you the manufacturers of each of more than fourteen hundred electronic and allied products.

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1950-1951

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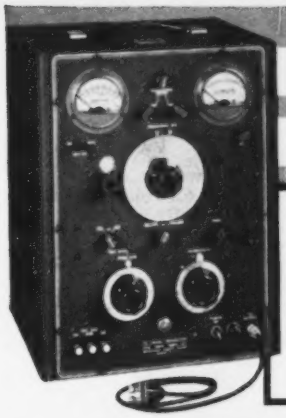
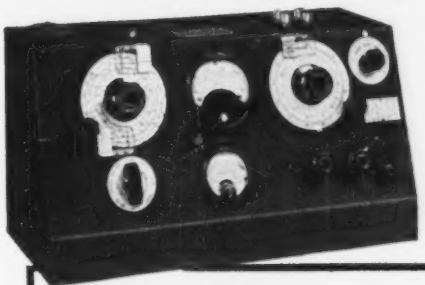


FM SIGNAL GENERATOR *TYPE 202-B*

RF COVERAGE: 54—216 megacycles in two ranges; accuracy ±0.5%.
FM DEVIATION: Three ranges, 0—24 kc., 0—80 kc., 0—240 kc., continuously adjustable.
FM DISTORTION: Less than 2% at 75 kc. deviation.
AMPLITUDE MODULATION: One range, 0—30%; calibrations at 30% and 50% modulation.
INTERNAL MODULATING FREQUENCIES: Eight frequencies from 50 cycles to 15 kc.
RF OUTPUT: 0.1 microvolt to 0.2 volt, continuously adjustable by means of 26.5 ohm piston type attenuator.

UNIVERTER *TYPE 203-B*

An FM-AM frequency converter accessory with unity gain for use with 202-B FM Signal Generator.
RF RANGE: 0.4 mc. to 25 mc.
RF INCREMENT DIAL: ±250 kc. in 10 kc. increments.
RF OUTPUT: 0.1 microvolt to 0.1 volt, calibrated output (26.5 ohms); 2 volts max. uncalibrated output (approx. 470 ohms).



Q-METER *TYPE 160-A*

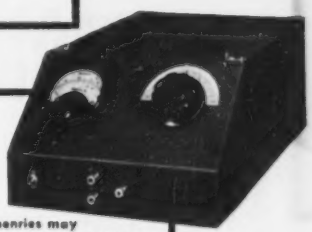
FREQUENCY RANGE: 50 kc. to 75 mc. (±1%, 50 kc.—50 mc.; ±3%, 50 mc.—75 mc.). May be extended down to 1 kc. with external accessory oscillator.
RANGE OF Q MEASUREMENTS, COILS: 50—625.
ACCURACY OF Q MEASUREMENT: In general, ±5%.
RANGE OF Q TUNING CAPACITOR: Main Section, 30—450 mmf. (±1% or ±1 mmf., whichever is greater). Vernier Section, plus 3, zero, minus 3 mmf., (±0.1 mmf.).

Q-METER *TYPE 170-A*

FREQUENCY RANGE: 30 mc. to 200 mc. (±1%).
RANGE OF Q MEASUREMENT: 80—1200.
ACCURACY OF Q MEASUREMENT: In general, ±10%.
RANGE OF Q TUNING CAPACITOR: 11—60 mmf. (±1% or ±0.5 mmf., whichever is greater).

QX-CHECKER *TYPE 110-A*

FREQUENCY RANGE: 100 kc. to 25 mc. using accessory plug-in inductors. A calibration sheet is supplied with each inductor, accurate to within ±3%.
RANGE OF COIL CHECKS: Inductors having values between 10 microhenries and 10 millihenries may be checked against a standard to an accuracy of about ±0.2% provided the Q of the inductor is 100 or greater.
CAPACITANCE RANGE: Capacitance values between about 2—1000 mmf. may be checked against standard by direct substitution, with an accuracy of a few tenths of one mmf., provided Q of capacitors is high.



OMNI RANGE

SIGNAL GENERATOR *TYPE 211-A*

FREQUENCY RANGE: 88-140 megacycles in one range. Also two crystal controlled frequencies: 110.100 and 114.900 mc., each accurate to ±0.0035%.
AMPLITUDE MODULATION: Two ranges, 0-30% and 0-100%. Fidelity ±0.5 db., 30 cycles to 11 kc.
INTERNAL AUDIO OSCILLATOR: Two modulating frequencies, 400 and 1000 cycles.
PHASE DISTORTION: Less than 0.25 degrees at 30 cycles up to 60% AM.
OUTPUT VOLTAGE: 0.2 volts maximum across 26.5 ohms.

Write for further information

BOONTON RADIO
BOONTON · N·J· U·S·A *Corporation*

(Model 901) PORTABLE TEST INSTRUMENTS available in DC, Model 901—and AC, Model 904, single and multiple ranges of wide coverage. Excellent scale readability and shielding. Accuracy within ½ of 1%.

SENSITIVE RELAYS a line of sensitive relays including the Model 705 which provides positive control at levels as low as ½ microampere. Non-chattering magnetic contacts handle up to 10 watts at 120 volts.

(Model 622) ULTRA-SENSITIVE INSTRUMENTS portable DC and AC Thermo instruments for precision measurement of potentials and minute currents involving electronics, thermo-couples or laboratory research.

INSTRUMENTS

TO SPEED AND SIMPLIFY ELECTRONIC PRODUCTION AND MAINTENANCE

Illustrated are but a few of the many specialized instruments available from WESTON . . . all designed to simplify and speed-up electrical and electronic installations, production testing, and maintenance. For details, see your local representative, or write Weston Electrical Instrument Corporation, 618 Frelinghuysen Avenue, Newark 5, New Jersey.

WESTON *Instruments*

ALBANY • ATLANTA • BOSTON • BUFFALO • CHARLOTTE • CHICAGO
CINCINNATI • CLEVELAND • DALLAS • DENVER • DETROIT • HOUSTON
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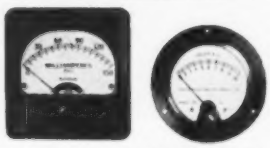
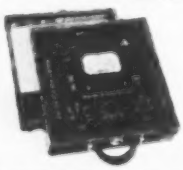
ORLANDO • PHILADELPHIA • PHOENIX • PITTSBURGH • ROCHESTER
SAN FRANCISCO • SEATTLE • ST. LOUIS • SYRACUSE • TULSA
IN CANADA, NORTHERN ELECTRIC CO., LTD., POWERLITE DEVICES, LTD.

(Model 798) MULTI-PURPOSE TUBE-CHECKER offering provision for testing Receiving Tubes — Voltage Regulator Tubes—Light Duty Thyratron Tubes such as 2A4—6D4—884—885—2051. Scale is calibrated "Good-Bad" as well as in mutual conductance range.



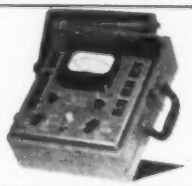
PANEL and SWITCHBOARD INSTRUMENTS a complete line of instruments in all types, sizes and ranges required for switchboard and panel needs . . . including DC, AC power frequencies and radio frequency, rectifier types and D.B. meters.

(Model 697) VOLT-OHM MILLIAMMETER one of a line of pocket-size meters, Model 697 combines a selection of AC and DC voltage, DC current, and resistance ranges. Ideal for maintenance testing and many inspection requirements.



(Model 785) INDUSTRIAL CIRCUIT TESTER a versatile, portable tester for laboratory or maintenance needs, where an ultra-sensitive instrument is required. Provides 27 AC and DC voltage, AC and DC current, and resistance ranges. (DC sensitivity 20,000 ohms per volt.)

(Model 779, Type 1) SUPER-SENSITIVE ANALYZER small, light, compact, 26 range Volt-Ohm-Milliammeter with 5 DC voltage ranges, sensitivity of 1000 or 20,000 ohms per volt. AC temperature compensated. Self-contained power supply. Ideal for many production and test requirements.



(Model 769) ELECTRONIC ANALYZER incorporating a conventional Volt-Ohm-Milliammeter with self-contained power source—a high-impedance electronic Volt-Ohmmeter using 115 volt, 60 cycle power—a stable, probe-type, Vacuum Tube Voltmeter, for use to 300 megacycles.

"EVEREADY" RADIO BATTERIES

BRAND

TYPES	VOLTAGE	LENGTH	WIDTH	HEIGHT	TERMINALS	SUGGESTED CURRENT RANGE	WEIGHT BATTERY
"A-B" PACKS FOR HOME RECEIVERS							
758	1.5 A	10 1/16"	4 1/16"	6 1/16"	Socket —, +1.5	A:200-300 m.a.	14 lb. 8 oz.
	90 B				Socket —, +90	B:7.0-12.0 m.a.	
759	1.5 A	15 1/16"	4 5/32"	6 1/16"	Socket —, +1.5	A:200-300 m.a.	17 lb. 6 oz.
	90 B				Socket —, +90	B:7.0-12.0 m.a.	
"A-B" PACKS FOR PORTABLE RECEIVERS							
753	7.5 & 9 A	9 7/32"	2 13/32"	4 5/8"	Socket —, +7.5 & 9	A:50 m.a.	4 lb. 15 oz.
	90 B				Socket —, +90	B:5.0-15.0 m.a.	
754	7.5 & 9 A	10 1/32"	3 1/4"	4"	Socket —, +7.5 & 9	A:50 m.a.	6 lb. 8 oz.
	90 B				Socket —, +90	B:5.0-15.0 m.a.	
755	6 & 7 1/2 A	8 5/16"	2 1/16"	3 3/4"	Socket —, +6 & 7 1/2	A:50 m.a.	3 lb. 8 oz.
	75 B				Socket —, +75	B:5.0-15 m.a.	
756	7.5 + 9A	8 7/8"	2 1/8"	3 13/32"	Socket —, +7 1/2 +9	A:50 m.a.	2 lb. 14 oz.
	90 B				Socket —, +90	B:5.0-15 m.a.	
"A" BATTERIES FOR HOME RECEIVERS							
A-1300*	1.25	5 5/16"	4 1/32"	8 5/8"	Socket —, +1.25	100-660 m.a.	6 lb.
#6 Dry Cell	1.5	2 5/8" D		6 5/8"	Screw —, +1.5	100-250 m.a.	2 lb. 2 oz.
"B" BATTERY FOR HOME RECEIVERS							
487	45	5 1/8"	2 1/16"	7 1/4"	Socket —, +22.5, +45	7.0-12.0 m.a.	4 lb. 4 oz.
"A" BATTERIES FOR PORTABLE RECEIVERS							
717	7 1/2	2 5/16"	1 1/8"	3 1/16"	Socket —, +7 1/2	50 m.a.	8 3/4 oz.
718	6	3 15/32"	2 3/4"	5 1/16"	Socket —, +6	50 m.a.	2 lb. 13 oz.
720	1.5	2 1/8"	1 3/8"	1/4"	Socket —, +1.5	100 m.a.	6 1/2 oz.
724	6	1 5/32"	1 5/32"	2 1/16"	Flat Contact —, +6	50 m.a.	2 5/8 oz.
726	4.5	3 1/8"	1 1/16"	2 1/16"	Socket —, +4.5	50 m.a.	10 1/2 oz.
736	4 1/2	3 1/8"	1 5/32"	4 1/32"	Socket —, +4.5	50 m.a.	1 lb. 1 oz.
741	1.5	3 7/8"	2 1/16"	5 3/8"	Socket —, +1.5	100-350 m.a.	2 lb. 13 oz.
742	1.5	2 7/16"	2 5/16"	3 1/4"	Socket —, +1.5	100-250 m.a.	1 lb. 6 oz.
743	1.5	3 1/8"	2 5/8"	4 5/16"	Socket —, +1.5	100-300 m.a.	2 lb. 1 oz.
744	6	2 3/32"	2 3/32"	3 3/32"	Socket —, +6	50 m.a.	1 lb. 6 oz.
745	1.5	3 7/8"	1 1/16"	10 1/32"	Socket —, +1.5	100-350 m.a.	2 lb. 13 oz.
746	4.5	3 1/8"	1 5/16"	4 1/32"	Socket —, +4.5	50 m.a.	1 lb. 4 oz.
747	6	3 7/8"	1 1/16"	10 1/32"	Socket —, +6	50 m.a.	2 lb. 13 oz.
"B" BATTERY FOR PORTABLE RECEIVERS							
482	45	3 1/32"	1 3/32"	5 1/2"	Socket —, +45	5.0-15.0 m.a.	1 lb. 14 oz.
"A" BATTERY FOR PERSONAL RECEIVERS							
950	1.5	1 21/64" D		2 3/32"	Flat Contact —, +1.5	25-250 m.a.	3 1/3 oz.
"B" BATTERIES FOR PERSONAL RECEIVERS							
455	45	2 3/32"	1"	3 1/32"	Snap Type —, +45	1.0-10.0 m.a.	8 oz.
457	67.5	2 1/32"	1 3/16"	2 1/2"	Snap Type —, +67.5	0.5-2.0 m.a.	7 2/3 oz.
467	67.5	2 1/32"	1 3/8"	3 1/32"	Snap Type —, +67.5	1.0-10.0 m.a.	12 oz.
490	90	3 5/32"	1 3/8"	3 1/32"	Snap Type —, +90	1.0-10.0 m.a.	1 lb. 1/2 oz.
"A" BATTERIES FOR POCKET RECEIVERS							
915	1.5	35/64" D		1 3/32"	Flat Contact —, +1.5	25-100 m.a.	1/2 oz.
1016	1.5	1 3/64" D	1/2"	2 1/64"	Flat Contact —, +1.5	25-100 m.a.	1.1 oz.
"B" BATTERIES FOR POCKET RECEIVERS							
411	15	1 1/32"	5/8"	1 29/64"	Flat Contact —, +15	0.3-1.0 m.a.	1 oz.
412	22.5	1 1/32"	5/8"	2"	Flat Contact —, +22.5	0.3-1.0 m.a.	1 1/2 oz.
413	30	1 1/32"	5/8"	2 5/16"	Flat Contact —, +30	0.3-1.0 m.a.	1 2/3 oz.
417	15	1 1/16"	1/4"	1 1/16"	Flat Contact —, +15	0.5-2.0 m.a.	1 2/3 oz.
420	22.5	1 1/16"	3/4"	2 5/16"	Flat Contact —, +22.5	0.5-2.0 m.a.	2 1/3 oz.
430	30	1 1/16"	1"	2 1/16"	Flat Contact —, +30	0.5-2.0 m.a.	3 oz.

*"Air-Cell" Battery

These Battery Engineering Bulletins are available on request: **1.** Batteries for post-war electronic equipment. **2.** "Mini-Max" "A-B" packs for 1.4 volt receivers. **3.** Batteries for vacuum tube hearing aids. **4.** High voltage batteries.

EVEREADY
TRADE-MARK

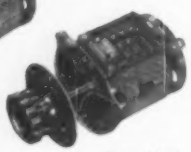
The registered trade-marks "Eveready," "Mini-Max," and "Air-Cell" distinguish products of

NATIONAL CARBON DIVISION
UNION CARBIDE AND CARBON CORPORATION
30 East 42nd Street, New York 17, N. Y.

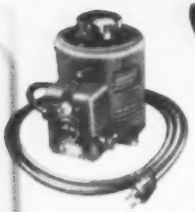
VOLTAGE CONTROL

POWERSTAT VARIABLE TRANSFORMERS

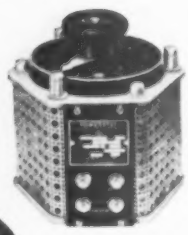
Type 20



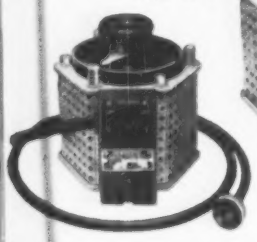
Type 116U



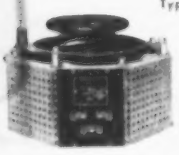
Type 116
216



Type 1126



Type 2PF1126



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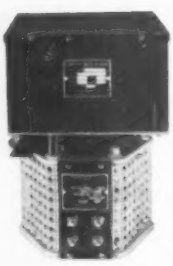

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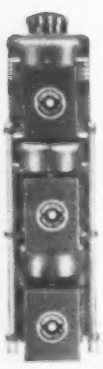


Type 116-3

Type 0-116

POWERSTAT variable transformers are autotransformers of toroidal core design with a movable brush-tap, which rotates to deliver a continuously-adjustable output voltage from a-c power lines. Manually-operated or motor-driven models are available. POWERSTATS feature excellent regulation, conservative ratings, standard mountings, smooth control and high efficiency. There's a POWERSTAT to meet every requirement.

RATINGS OF STANDARD TYPES

Although not all of the standard units are listed, the chart below indicates the wide range of types offered.

Line Voltage	Output Voltage	Maximum Output Amperes	Output KVA	Frequency	Type	†Standard Motor Speeds
Single Phase						
	0-135	3.0	0.4	*60	20	—
	0-135	7.5	1.0	50/60	116	5
	0-135	15.0	2.0	50/60	1126	6, 14, 19, 45
	0-135	30.0	4.0	50/60	1126-2P	6, 14, 19, 45
	0-135	45.0	6.1	50/60	1156	6, 14, 19, 45
115	0-135	90.0	12.1	50/60	1156-2P	6, 14, 19, 45
	0-135	135.0	18.2	50/60	1156-3P	6, 14, 19, 45
	0-135	180.0	24.3	50/60	1156-4P	14, 19, 45
	0-135	270.0	36.4	50/60	1156-6P	14, 19, 45
	0-270	3.0	0.35	50/60	216	5
	0-270	9.0	1.05	50/60	1226	6, 14, 19, 45
	0-270	28.0	3.27	50/60	1256	6, 14, 19, 45
	0-270	3.0	0.81	50/60	216	5
	0-270	7.5	2.0	50/60	116-2S	5
	0-270	9.0	2.4	50/60	1226	6, 14, 19, 45
	0-270	15.0	4.0	50/60	1126-2S	6, 14, 19, 45
230	0-270	28.0	7.5	50/60	1256	6, 14, 19, 45
	0-270	45.0	12.1	50/60	1156-2S	6, 14, 19, 45
	0-270	56.0	15.1	50/60	1256-2P	6, 14, 19, 45
	0-270	84.0	22.7	50/60	1256-3P	6, 14, 19, 45
	0-270	112.0	30.2	50/60	1256-4P	14, 19, 45
	0-270	168.0	45.0	50/60	1256-6P	14, 19, 45
	0-540	3.0	0.7	50/60	216-2S	5
	0-540	9.0	2.1	50/60	1226-2S	6, 14, 19, 45
	0-540	28.0	6.5	50/60	1256-2S	6, 14, 19, 45
	0-540	3.0	1.6	50/60	216-2S	5
	0-540	9.0	4.8	50/60	1226-2S	6, 14, 19, 45
460	0-540	28.0	15.1	50/60	1256-2S	6, 14, 19, 45
	0-540	56.0	30.2	50/60	1256-4PS	14, 19, 45
	0-540	84.0	45.3	50/60	1256-6PS	14, 19, 45
Three Phase						
	0-135	3.0	0.7	*60	20-2D	—
	0-135	7.5	1.8	50/60	116-2D	5
	0-135	15.0	3.5	50/60	1126-2D	6, 14, 19, 45
115	0-135	45.0	10.5	50/60	1156-2D	6, 14, 19, 45
	0-135	90.0	21.0	50/60	1156-4D	14, 19, 45
	0-135	135.0	31.6	50/60	1156-6D	14, 19, 45
	0-270	3.0	0.6	50/60	216-2D	5
	0-270	9.0	1.8	50/60	1226-2D	6, 14, 19, 45
	0-270	28.0	5.7	50/60	1256-2D	6, 14, 19, 45
	0-230	3.0	1.2	60	20L-3Y	—
	0-270	3.0	1.4	50/60	216-2D	5
	0-270	7.5	3.5	*60	116-3Y	5
	0-270	9.0	4.2	50/60	1226-2D	6, 14, 19, 45
	0-270	15.0	7.0	*60	1126-3Y	6, 14, 19, 45
	0-270	28.0	13.1	50/60	1256-2D	6, 14, 19, 45
230	0-230	45.0	17.9	50/60	1156L-3Y	6, 14, 19, 45
	0-270	56.0	26.2	50/60	1256-4D	14, 19, 45
	0-270	84.0	39.3	50/60	1256-6D	14, 19, 45
	0-230	90.0	35.8	50/60	1156L-6Y	14, 19, 45
	0-540	3.0	1.2	*60	216-3Y	5
	0-540	9.0	3.6	*60	1226-3Y	6, 14, 19, 45
	0-540	28.0	11.3	*60	1256-3Y	6, 14, 19, 45
	0-540	3.0	2.8	*60	216-3Y	5
460	0-540	9.0	8.3	*60	1226-3Y	6, 14, 19, 45
	0-540	28.0	26.1	*60	1256-3Y	6, 14, 19, 45
	0-540	56.0	52.2	*60	1256-6Y	14, 19, 45

*When these POWERSTATS are "L" connected so that output does not exceed applied voltage, frequency range is 50/60 cycles.

†Seconds required for full range travel.

THE SUPERIOR ELECTRIC COMPANY, BRISTOL, CONN.

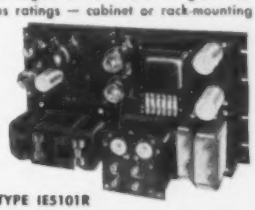
by SUPERIOR

STABILINE VOLTAGE REGULATORS

Input Voltage Range	Output Voltage Range	Frequency in Cycles	Load Range in Amperes	Load Power Factor Range	Rated Output KVA	Type
95-135	110-120	60 ± 10%	0 - 2.2		0.25	IES1002
95-135	110-120	60 ± 10%	0 - 2.2		0.25	IES1002R
95-135	110-120	60 ± 10%	0 - 4.5		0.5	IES1005
95-135	110-120	60 ± 10%	0 - 4.5	.5 lagging	0.5	IES1005R
95-135	110-120	50 ± 10%	0 - 4.5		0.5	IEL51005
95-135	110-120	50 ± 10%	0 - 4.5		0.5	IEL51005R
195-255	220-240	50 ± 10%	0 - 2.2	to	0.5	IEL52005
195-255	220-240	50 ± 10%	0 - 2.2		0.5	IEL52005R
95-135	110-120	60 ± 10%	0 - 8.5		1.0	IES101
95-135	110-120	60 ± 10%	0 - 8.5	9 leading	1.0	IES101R
95-135	110-120	50 ± 10%	0 - 8.5		1.0	IEL5101
95-135	110-120	50 ± 10%	0 - 8.5		1.0	IEL5101R
195-255	220-240	50 ± 10%	0 - 4.5		1.0	IEL5201
195-255	220-240	50 ± 10%	0 - 4.5		1.0	IEL5201R
95-135	110-120	60 ± 10%	0 - 22.0		2.5	IES102
95-135	110-120	60 ± 10%	0 - 22.0		2.5	IES102R
195-255	220-240	60 ± 10%	0 - 11.0		2.5	IES202
195-255	220-240	60 ± 10%	0 - 11.0		2.5	IES202R
195-255	220-240	50 ± 10%	0 - 11.0		2.5	IEL5202
195-255	220-240	50 ± 10%	0 - 11.0		2.5	IEL5202R
95-135	110-120	60 ± 10%	0 - 43.5		5.0	IES105
195-255	220-240	60 ± 10%	0 - 22.0		5.0	IES205

INSTANTANEOUS ELECTRONIC MODELS

Completely electronic voltage regulators; instantaneous in action; no moving parts. Waveform distortion never exceeds 3%. Output voltage is held to ±0.1% regardless of line fluctuations; to within ±0.15% regardless of load changes. Available in numerous ratings — cabinet or rack-mounting models.



TYPE IES101R

Nominal Output Voltage	Input Voltage Range	Output Voltage Range	Output Current (Amperes)	Output KVA	Type
Single Phase					
115	95-135	110-120	17.5	2.0	EM4102
			52.0	6.0	EM4106
			130.0	15.0	EM4115
230	195-255	220-240	32.5	7.5	EM4207
			120.0	27.5	EM4228
440	380-500	420-460	15.0	6.6	EM4407
			40.0	17.6	EM4418
Three Phase					
230	195-255	220-240	25.0	10.0	EM6210Y
			38.0	15.0	EM6215Y
			50.0	20.0	EM6220Y
			113.0	45.0	EM6245Y
			175.0	70.0	EM6270D
440	380-500	420-460	16.0	12.0	EM6412Y
			22.0	17.0	EM6417Y
			33.0	25.0	EM6425Y
			66.0	50.0	EM6450Y
			100.0	75.0	EM6475Y
	400-480	420-460	131.0	100.0	EM64100Y

ELECTROMECHANICAL MODELS

Consist of electronic detector circuit controlling motor-driven POWERSTAT variable transformer. Feature zero waveform distortion; insensitivity to magnitude and power factor of load. No effect on system power factor; no critical adjustments. High efficiency and adjustable output voltage. These models maintain constant output voltage regardless of variations in input voltage or load current.

TYPE EM4115

VOLTBOX a-c power supplies

TYPE UC1M

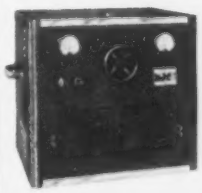
Compact, portable sources of variable a-c voltage. All components in cast aluminum case. Type UC1M: 115 volts, 50/60 cycles, 1 phase; 0-135 volts, 7.5 amperes output. Type UC2M: 230 volts, 50/60 cycles, 1 phase; 0-270 volts, 3.0 amperes output.

5-WAY BINDING POST

TYPE DF30

1. Permanent clamping.
2. Spade lug.
3. Clip lead.
4. Plug-in for banana plug.
5. Looping and clamping.

THE VARICELL



This ideal source of low d-c voltage provides: a variable range of d-c voltage; operation from a-c source; compensation for load changes; elimination of line variations in output; extremely low ripple voltage.

Engineering service available for overcoming your voltage problems. Write for Bulletins P550 and S750, illustrated voltage control engineering data catalogs.

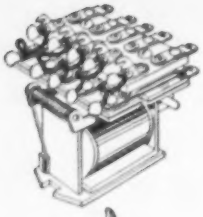
4000 MEADOW STREET
BRISTOL, CONNECTICUT

THE SUPERIOR ELECTRIC CO.

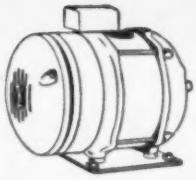
BRISTOL, CONNECTICUT

SECO

POWERSTAT VARIABLE TRANSFORMERS • VOLTBOX A-C POWER SUPPLIES • STABILINE VOLTAGE REGULATORS



WANTED
Tough Insulation Problems



Put BH Fiberglas Sleeving or Tubing to work on tough insulation problems in your product or plant equipment and eliminate the possibilities of insulation breakdown. Whether the problem is excessive current load, vibration, extreme temperatures, greases, oils or moisture — or when flexibility is essential — there is a BH product to solve it. Write for samples for laboratory and production testing. Include a few facts about your product, requirements, voltages and temperatures encountered. Let BH Fiberglas insulations do a better job for you. BENTLEY HARRIS MFG. CO., CONSHOHOCKEN, PA.

BH EXTRA FLEXIBLE FIBERGLAS SLEEVING

Remarkably flexible because no hardening varnish is used. Cuts without fraying and is non-combustible. Available in all colors. Basic sleeving withstands heat to 1200°F. Color unaffected up to 300°F.

BH SPECIAL TREATED FIBERGLAS SLEEVING

Heat resistant to 1200°F. Supplied in natural color only. Where colors are required, specify BH Extra Flexible. Cuts clean. Maximum flexibility. Unsaturated. Also available in 1/32" and 1/16" minimum wall.

OTHER BH FIBERGLAS PRODUCTS

Bon Hat Special Treated Fiberglas Tubing: available in Grade A-1 — 7000V and Grade B-1 — 4000V. Flexibility combined with toughness. *Saturated Fiberglas Sleeving:* available in Grades C-1, C-2 and C-3. Special treated to prevent fraying.

BH "649"

A superior Fiberglas insulation at the price of ordinary cotton-base or rayon-base insulations. Available in Grades A-1, B-1, C-1, C-2. In all sizes from No. 24 to 5/8" inclusive.

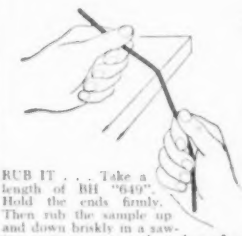
Retains rated dielectric strength even after rough handling, severe bending. Often a less expensive grade of insulation can be used since there is little or no loss of dielectric strength in assembly or product use.

Non-burning, non-fraying, non-stiffening. Stays supple after baking 12 hours at 300°F. No flowing, softening or blistering after 15 minutes at 425°F. Physical and dielectric properties unimpaired after baking at 220°F. to 280°F. for 1,000 hours.

BH RAYON OR COTTON-BASE SLEEVING AND TUBING

Tubing: Magneto Varnished Tubing Grade "A-2"; Flexible Varnished Tubing Grade "B-2". *Sleeving:* Saturated Sleeving Grades C-1, C-2, C-3.

KNOT IT . . . Take a length of BH "649". Knot it. Pull it as tight as you can. Twist it. Then loosen the knot. There is no cracking. No change in the dielectric strength.



RUB IT . . . Take a length of BH "649". Hold the ends firmly. Then rub the sample up and down briskly in a sawing motion against the edge of a desk or chair. See how difficult it is to damage the coating.

HOLD A MATCH UNDER IT . . . Take a length of BH "649". Hold a lighted match under it. BH "649" will not support combustion.

BH *Fiberglas** SLEEVINGS

*BH Non-Fraying Fiberglas Sleevings are made by an exclusive Bentley, Harris process (U. S. Pat. No. 2395501). "Fiberglas" is Reg. TM of Owens-Corning Fiberglas Corp.

COUPON

Bentley, Harris Mfg. Co., Dept. E-6, Conshohocken, Pa.

I am interested in BH Fiberglas Insulations _____ for _____ (size or I.D.)

_____ operating at temperatures of _____ °F. at _____ volts. Send samples (product)

so I can see how BH Fiberglas Sleeving stays flexible as string, will not crack when bent.

NAME _____ COMPANY _____

ADDRESS _____

Send samples, pamphlet and prices on other BH Products as follows:

☐ Cotton or Rayon-base Sleeving and Tubing

PARTS

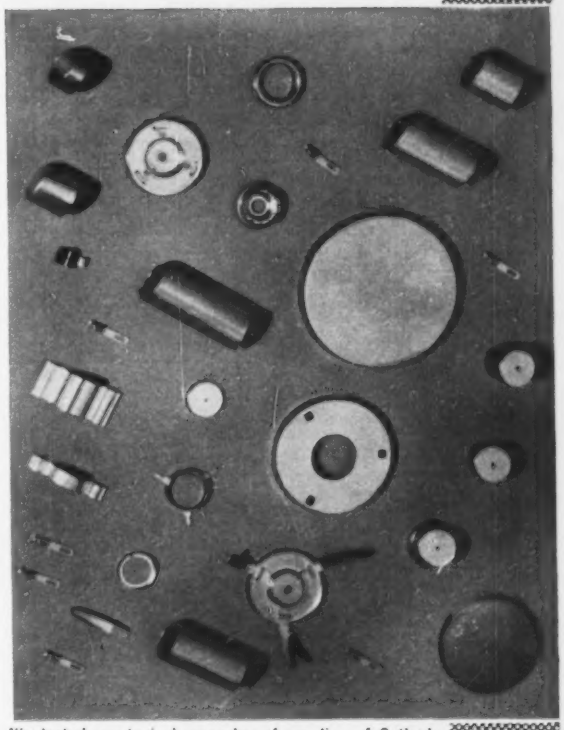
For Cathode Ray Tubes For Electronic Component Applications...

Our TV gun parts are available for quick delivery in a wide range of lengths, angles, and aperture sizes. Designed for both tilted and straight gun application. Parts feature no visible seams, exclusive high polish finish and mass produced to a high standard of quality and uniformity. Samples available on request.

We also specialize in general metal and mica precision stampings for other electronic applications. Our completely equipped tool and die shop in conjunction with high speed automatic production facilities is prepared to undertake your most critical and exacting parts problems from design to completed product.

Consult with J & H on large or small production requirements.

Your inquiries will receive prompt attention.



Illustrated are typical examples of our line of Cathode Ray Tube gun parts and other electronic specialty items currently being produced for leading manufacturers.

CATHODE RAY TUBE PARTS • RECEIVING AND TRANSMITTING TUBE PARTS • DEEP DRAWN STAINLESS STEEL PARTS • METAL STAMPINGS • MICA STAMPINGS • TUBE SOCKET METAL PARTS • TOOLS & DIES • JIGS & FIXTURES • COATED HEATERS.

ELECTRONIC J&H PARTS

JOHNSON & HOFFMAN, INC.

65 ONGLEY STREET • ROCKVILLE CENTRE, N.Y.

Telephone: Rockville Centre 6-0500

ELECTRONIC AND MECHANICAL ENGINEERING CONSULTING SERVICE AVAILABLE

Jennings RADIO
VACUUM ELECTRONIC COMPONENTS

FIXED and VARIABLE HIGH VOLTAGE VACUUM CAPACITORS

SPECIFICATIONS

	FIGURES	NICKEL TYPES	COPPER TYPES	CAPACITY MMFD	PEAK VOLTAGE KILOVOLTS	RMS AMPERES NICKEL	RMS AMPERES COPPER	OVERALL LENGTH	MAXIMUM O.D.	CONTACT DIAMETER	MOUNTING CENTERS
VACUUM FIXED CAPACITORS	18,12	VC	VCC	6,12,25,50,75,100,150	20, 25, 30	14	42	6 1/2	2 1/4	13/16	5 1/8
	18,12	VC	VCC	200, 250	20, 25, 30	14	42	6 1/2	2 11/16	13/16	5 1/8
	13	W		6, 12, 25, 50, 100	20	10.5		4 3/16	2 1/4	5/8	3 7/8
	14	X		5, 10, 15, 20, 25	17	7		3 1/4	1 1/4	11/32	2 7/8
	15	Y		1, 2, 3, 4, 5	17	7		3 1/4	7/8	11/32	2 7/8
	6		JCS-1	25, 50, 75, 100, 150	7.5, 10, 15		28	3 1/8	2 11/32	33/64	3
	5		JCS	250	7.5, 10, 15		42	3 1/8	2 3/8	33/64	3 1/8
	4		JCS	500	7.5, 10		42	3 1/8	3 1/8	33/64	3 1/8
			JCS	1000	7.5, 10		42				
			JC-1	25	10, 15		21	4	1 1/2	9/16	3 1/16
	7		JC-2	25, 50, 100	15, 20, 25		42	3 3/4	3 1/8	33/64	3 1/8
	3		JC-3	20, 40, 50, 60	35, 40, 50, 60		140	8 1/4	4	2	6 1/8
	2		JC-4	100, 125	35, 40, 50, 60		140	9 1/4	5	3 1/8	7
	1		JC-5	200	35, 40, 50, 60		140	11 1/4	7	4 1/8	8 3/4
	9	M	MC	500, 750, 1000	10, 15, 20	21	60	8 1/8	5	2	6 1/4
	10	ML	MLC	500, 750, 1000	25, 30	21	60	9 1/4	5	2	7 1/8
	9	MH	MHC	200 or less	35, 40, 50	21	60	8 1/2	5	2	6 1/8
	8	MM	MMC	1500, 2000	10, 15	21	60	9 1/4	6 1/8	4 1/8	6 3/4
	8	MMH	MMHC	450	35, 40, 45	21	60	9 1/8	6 1/8	4 1/8	6 13/16
	11	K		50	35, 40, 50	14		8 1/2	3	13/16	7 3/4
VACUUM VARIABLE CAPACITORS	21	T		5-25	20	10.5		6 1/4	2 1/4	1/2 x 1/8	4
	22		TC	5-25	20		21	6 1/4	2 1/4	5/8	4
	21	TR		2-8	17	10.5		6 1/2	2 1/4	11/32 x 5/8	4
	22		TRCS	2-8	7.5, 10, 15		21	6 3/16	2 1/4	5/8	4
	19	SS		10-30 per section	25, 30, 35	7		6 1/8	3	11/32 x 5/8	3 7/8 x 2 3/4
	20		SSC-1	2-10 per section	10		15	6 1/16	2 1/8	9/16 x 5/8	1 1/2 x 3 7/8
	21	AT		10-50	20, 25, 30	10.5		6 1/2	3	1/2 x 5/8	4 3/16
	28		UCS	5-200	7.5, 10, 15		42	8 9/32	2 1/8	33/64 x 2	4 9/32
	28		UCS	10-300	7.5, 10, 15		42	8 3/4	2 1/8	33/64 x 2	4 1/8
	28		UCS	25-500	7.5, 10, 15		42	8 3/4	3	33/64 x 2	4 1/8
	27		UCSX	10-500	7.5, 10		42	6 3/8	3 1/8	33/64 x 3 1/8	5 3/4
			UCSX	25-700	7.5, 10		42	6 1/8	3 3/4	2 x 3 1/8	4 7/16
			UCSX	100-1000	7.5, 10		42	6 1/8	3 3/4	2 x 3 1/8	4 11/16
	26	U	UC	50-250	10, 15, 20	21	60	11 7/16	5	2	6 1/2
	26	UH	UHC	10-75	35, 40, 50	21	60	11 7/16	5	2	6 1/2
	26	UH	UHC	75-150	35, 40, 50	21	60	12	5	2	7 1/16
	25	UX	UXC	40-560	10, 15	21	56	14	5	3 1/8	7 1/8
	25	UXH	UXHC	25-150	35, 40, 50	21	60	14 1/8	5	3 1/8	8 1/4
	24	VM	VMC	50-1000	10, 15	21	60	14	7	3 1/2	7 1/8
	23	VMM	VMMC	100-2000	10, 15	21	85	15 1/4	6 1/2	4 1/8	8 1/8
	23	VMMH	VMMHC	25-450	35, 40, 45	21	85	15 3/8	6 1/4	4 1/8	8 1/2
TRIODE	16		TAS-1 50-JR	2-10 per section Air-Cooled Tubes	10		21	7 3/4	2 7/8	9/16 x 1/8	1 1/2 x 3 7/8
	17		TW-1 889-A	UXC 40-560 Water-Cooled Tube	5 KW			21	5	3 1/8	7 1/8
	Also available in both air- and water-cooled units from 50 watts to 25 kilowatts. Write for details.										
MISC.	30		R-1	Vacuum Relay	10		30	7	3	1/8	5 1/8
	30		R-2	Vacuum Relay	15		7.5	9	3	1/8	7 1/8
	29			Vacuum Transformer 2-1 step-up to 40 kv.				5 3/4	2 1/2	11/32	

CURRENT RATINGS MAY BE INCREASED BY FORCED COOLING WITH ADEQUATE MOUNTINGS
CORRESPONDENCE INVITED FOR OTHER CAPACITIES AND VOLTAGES

JENNINGS RADIO MANUFACTURING COMPANY • 1098 E. WILLIAM STREET • SAN JOSE 12, CALIFORNIA

Originators, Exclusive Designers and Producers of **JENNINGS**

Jennings RADIO

VACUUM ELECTRONIC COMPONENTS

FIXED AND VARIABLE HIGH VOLTAGE VACUUM CAPACITORS

Also TRONADS in both air- and water-cooled units from 50 watts to 25 kilowatts

Vacuum relay and transformer units

See opposite page for Specifications of the Jennings Fixed and Variable High Voltage Vacuum Capacitors and other items shown below. Watch Jennings for new developments in the field of Specialized Vacuum Electronic Components. Special Characteristics on a to-order basis. We welcome your inquiry and the opportunity to serve you.

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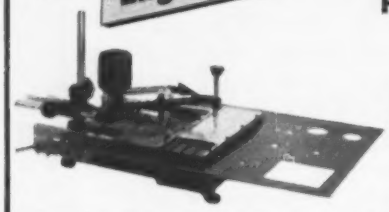
NOW Production-Line Engraving of BIG Panels

with the GREEN PANEL ENGRAVER



Here's the answer to high engraving costs on large instrument and control panels! No special jigs and fixtures needed with this new Green Panel Engraver . . . saves time . . . does a neater, more accurate job. The principle difference between this and the standard model is found in the master copy carrier which is supported above the machine base. Panels ⅛" thick by 19" wide by any length may be engraved.

Like the famous standard Green Engraver, this new machine does sharp engraving on plastic, metal or wood surfaces by merely tracing master copy. Easily operated by anyone who can write.

If you're fed up with high engraving costs, the Green story makes pleasant reading. So write for details today. Pat. appl'd for

New accessories cut costs on special jobs

GREEN DRUM ENGRAVER

Rules and engraves in *one* operation. Adaptable to many diameters . . . simple, precise indexing

GREEN RADIAL ENGRAVER

Engraves in curves from straight line master copy with automatic spacing. No guesswork or inaccuracies . . . no hand layouts. Pat. appl'd for

GREEN

GREEN INSTRUMENT CO.
363A Putnam Ave., Cambridge, Mass.

CONTROLLED QUALITY . . .

CUSTOM-BUILT FOR ELECTRONIC, INDUSTRIAL, AND POWER APPLICATIONS

TRANSFORMERS
REACTORS
RESONANT FILTERS

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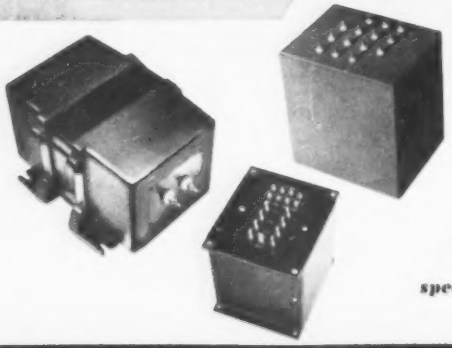
Top Engineering and Workmanship



We have been solving the transformer engineering problems of industry and government since 1938!

Write or phone us regarding your special requirements.

ELECTRONIC TRANSFORMER COMPANY, INC.
209 West 25th Street · WAtkins 4-0880 · New York 1, N. Y.

REFERENCE SHEET SECTION

A popular feature
of ELECTRONICS
since its first issue
has been
its Reference Sheets . . .
pages that constitute
graphical and tabular shortcuts
for engineers who
design, produce, install
and maintain
electronic equipment.

•

21 of these sheets that
have proven generally useful
over the years
are presented again
in this book. Many of these
have been revised
and brought up-to-date.
In addition, a complete index
of all the
engineering Reference Sheets
that have appeared
in ELECTRONICS,
since its first issue
April 1930, is
included in this book.

electronics BUYERS' GUIDE

THE 13th ISSUE OF ELECTRONICS

DRIVER-HARRIS

Your dependable source for

Wire and Ribbon
Resistor and Radio Alloys

FOR RESISTANCE

There are Driver-Harris Alloys for every electrical resistance requirement. Most widely used are:

. . . **Nichrome*** and **Nichrome* V,** for winding large value resistors where overall size is limited, but dependability is a must.

. . . **Manganin,** for fixed stability and constant resistance under normally variable operating conditions; examples being precision bobbins, potentiometers, National Bureau of Standards type resistance standards.

. . . **Advance*,** most frequently specified for precision resistors in electric meters and laboratory testing devices, because in its finer sizes it has a temperature coefficient of only ±.00002/°C.

. . . **Karma*,** high ohmage, 800 ohms/cmf at 20°C., makes possible extremely small resistors. Especially suitable for service in resistors requiring negligible temperature coefficient of resistance. Thermal e.m.f. against copper only .002 millivolts / °C. between 0°C. and 100°C. Where mechanical strength is important, larger diameter Karma wire can be used for a given resistance per foot.

. . . Plus a total of more than 80 *electrical heat and corrosion-resistant* alloys which singly, or in combination fill any electrical resistance specifications.

FOR RADIO

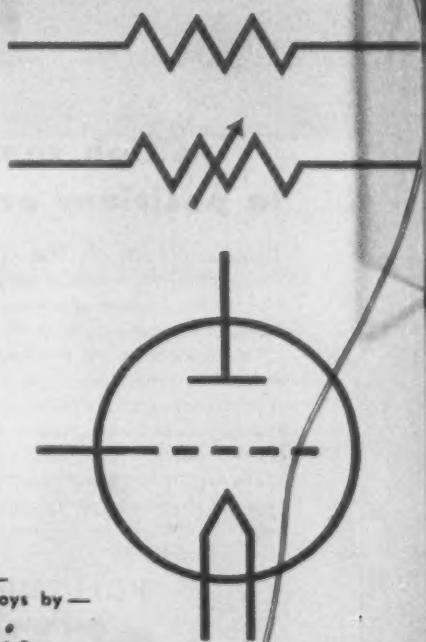
Always abreast of the latest developments in radio metallurgy, Driver-Harris has been headquarters for Radio Alloys since the earliest days of the industry. In greatest demand are:

. . . **Nickel and Nichrome***, for plate strip. Thin but rigid, they take a tightly adhering heat radiation coat.

. . . **Gridnic* Alloys,** having a very low electron emission — especially suitable in tubes where back-emission is involved.

. . . **Cathode Sleeve Material:** special melted Nickel Alloys to meet any emission requirements.

Other widely accepted D-H Alloys, meeting or exceeding most radio specifications are: *Nilvar**, *#42 Alloy*, *#52 Alloy*, and *Nickel "A"*, "D", "E", "Z".



For efficiency and dependability —
Specify Electrical Resistance and Radio Alloys by —

Driver-Harris COMPANY

HARRISON • NEW JERSEY

BRANCHES: Chicago • Detroit • Cleveland • Los Angeles • San Francisco • Seattle
The B. GREENING WIRE COMPANY, LTD., Hamilton, Ontario, Canada

*Trade Mark Reg. U. S. Pat. Off.

High sensitivity, instant response in position- or speed-control servo systems

The Kollsman Synchronous Differential is an electro-mechanical device, combining two small hysteresis-type, variable frequency synchronous motors with a smoothly functioning system of differential gearing.

This torque-producing, half-speed synchroscope, designed in various models to operate from single- or polyphase sources, is applicable in many position- and speed control servo systems wherein a high degree of precision is essential.

The Synchronous Differential represents a complete line of miniature special purpose AC motors precision-engineered by Kollsman, specialists for over twenty years in aircraft instrumentation and control. The line includes induction motors, and generators, Teletorque units, permanent magnet generators, drag cup motors, Circutrols and motor-driven induction generators.

Among these, the design engineer may well find the exact solution to his instrumentation or control problem. If not, the skill and experience of Kollsman engineers are available to produce units that meet his exact specifications. For complete information, write: Kollsman Instrument Division, Square D Company, 80-64 45th Avenue, Elmhurst, New York.

KOLLSMAN INSTRUMENT DIVISION

SQUARE D COMPANY

ELMHURST, NEW YORK GLENDALE, CALIFORNIA

HARDWICK, HINDLE

PROUDLY ANNOUNCES ITS NEW

NATIONAL RESISTORS

Completely Sealed · Completely Satisfactory

- ✓ the core is stronger, and has higher resistance to vibrations and shock.
- ✓ the resistance wire—made to H.H. specifications especially adapted to these resistors—is more uniformly wound so that failures under stress are eliminated.
- ✓ the special alloy terminals are more securely fastened to the ceramic body by spot-welding—highly resistant to corrosion.
- ✓ all wire connections are protected by a positive, non-corrosive bonding.

and . . .

✓ *new*—blue-gray enamel coating—crazeless, thermo-shock-proof gives greater protection throughout the most rugged service—longer life under extremes of humidity, salt water and severest atmospheric conditions. And by withstanding higher heat these resistors ✓ afford a greater safety factor.

The fixed, the ferrule and the flat types are especially designed for and manufactured in accordance with JAN-R-26A specifications.

HARDWICK, HINDLE, INC.

Rheostats and Resistors

Subsidiary of

THE NATIONAL LOCK WASHER COMPANY

ESTABLISHED 1886

NEWARK 5, N. J. U.S.A.

the mark of quality

for more than a quarter of a century

Hardwick, Hindle, Inc.
40 Harmon St., Newark 5, N. J.

Please send additional information about your new resistors.

Name_____

Title_____

Company_____

Address_____

CHECK THESE *TURBO* PRODUCTS

WILLIAM BRAND & COMPANY maintain an extensive research laboratory where all TURBO products are continuously tested for assurance of "as rated" characteristics. New materials, as they are developed, are subjected to series of accelerated breakdown tests against all known deteriorating agents before such materials are incorporated into TURBO manufacturing processes. WILLIAM BRAND & COMPANY invites users to submit their electrical insulation problems of any nature for study and recommendation.

TURBO VARNISHED TUBING

For Extra Dependability At No Extra Cost!

TURBO Varnished Tubing is a braided cotton sleeve impregnated with a fine insulating varnish. Ideal for general application, it features high tensile strength, good flexibility, non-peeling and non-cracking qualities, low moisture absorption, oil and acid resistance plus moderate cost. Perfect concentricity facilitates wiring and a wide range of sizes meets all applications.

TURBO
RADIO GRADE
4000 V.
BREAKDOWN
A·S·T·M TEST

TURBO
MAGNETO GRADE
7000 V.
BREAKDOWN
A·S·T·M TEST

TURBO INSULATED WIRE

- AVAILABLE FOR 300 AND 600 V.
- NON-DETERIORATING VINYL DIELECTRIC
- WITHSTANDS POTTING TEMPERATURES
- NON-POROUS, NON-FRAYING
- FREE STRIPPING INSULATION
- FLEXIBLE

...now you need stock but one wire for every hook-up and lead requirement!

TURBO REL 16-A is a free-stripping insulated wire composed of a tinned copper conductor (for rapid production) covered with a layer of non-deteriorating vinyl plastic (for permanent electrical protection), overlaid with a close-woven lacquered glass jacket (for top mechanical protection). THIS IS THE FIRST THERMOPLASTIC WIRE TO EARN UNDERWRITERS' RECOGNITION FOR 105°C CONTINUOUS OPERATION!

TURBO SATURATED SLEEVING*

*EXCLUSIVELY PROCESSED FOR

SIZES —
40 sizes from .022" to 1.5" inside dia.

LENGTHS —
Standard bundles of 42" strands. Sizes 13 to 24 inclusive can be supplied in any length on spools.

COLORS —
Black, yellow, red, green, brown, blue. Standard up to size No. 12. Black and yellow on large sizes. Other colors special.

- HIGHER TENSILE STRENGTH
- GREATER FLEXIBILITY
- ABSOLUTE CONCENTRICITY
- SLOW BURNING COMPOSITION
- LOW MOISTURE ABSORPTION
- FREEDOM FROM PEELING

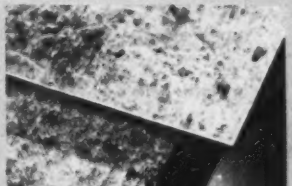
A low cost insulation tubing impregnated for maximum serviceability and extra long life!

TURBO Saturated Sleeving is made from select cotton braid sleeving saturated with a special TURBO varnish that seals every pore without impairing flexibility. This low cost tubing is ideal for general wiring applications, for moderate temperature extremes and where electrical stress does not exceed 1200 V.

TURBO MICA PRODUCTS

TURBO MICA
A GRADE FOR EVERY ELECTRICAL REQUIREMENT!

MICA comprises a group of natural silicates distinguished by highly developed basal cleavage into thin, tough, flexible laminations. Used as electrical insulation, TURBO MICA POSSESSES IDEAL ELECTRICAL PROPERTIES.



HEATER PLATE MICA—For direct contact with heat, 1000°F—625 VPM. FLEXIBLE PLATE MICA—Plastic and moldable, 525 VPM. SEGMENT PLATE MICA—Soft edged to wear with commutator bars, 625 VPM. MOLDING PLATE MICA Becomes moldable at 284°F, 600 VPM on flat sheets. INDIA SEGMENT PLATE—Similar to segment plate but harder and has higher thermal characteristics. B-H-1 and 2 PLATE MICA—A built-up mica plate, high rigidity and temperature resistance (302°F). BLOCK MICA to rigid specifications, all standard sizes. MICA FILMS for mica condensers.

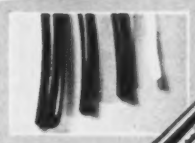
TURBO CAMBRICS, TAPES, CLOTHS AND PAPERS are treated with multiple coats of baked-on varnishes for excellent protection against voltage breakdown, oils, moisture and alkalies, under the most severe operating conditions. All standard types, sizes, lengths and colors are available.

WILLIAM BRAND & COMPANY
GENERAL OFFICES: WILLIMANTIC, CONN. • 1313 W. RANDOLPH ST., CHICAGO, ILL.

FOR ALL *INSULATION* NEEDS

The part of the entire cost of an electrical product represented by its insulation is indeed small. However, the insulation is perhaps the most vital non-operating part of the product! For where failures do occur in electrical equipment, over 85% of them are due to faulty insulation! Evidently then, nothing but the finest in insulating materials must be used to assure top-most dependability. This is why most reputable manufacturers insist on BRAND TURBO insulations for their products.

TURBO EXTRUDED TUBING



SPECIFICATIONS	
SIZES	36 SIZES FROM .25" TO 1.5" INSIDE DIA.
LENGTHS	CONTINUOUS LENGTHS 25' UP, DEPENDING UPON SIZE OF TUBING
COLORS	BLACK, YELLOW, RED, GREEN, BLUE, BROWN, WHITE AND TRANSPARENT

TURBO THE COMPLETE LINE OF SUPERIOR INSULATING MATERIALS

A HOMOGENEOUS VINYLITE PLASTIC TUBING FORMED ON EXTRUSION PRESSES

Here is one of the finest electrical tubings made. It is ideal for service covering high temperatures or wide fluctuation of temperature. Its homogeneous vinyl covering—forming a deterioration resisting dielectric barrier—is furnished to close tolerances for close fitting insulation. In 36 sizes up to 1.5" ID, continuous lengths and 7 colors plus transparent.

TURBO REL 16-A TUBING

THE NEW TURBO THERMO PLASTIC TUBING

FOR HIGH HEAT APPLICATIONS

REL 16-A is the new TURBO tubing that features—

- EXTREME HEAT RESISTANCE, UL APPROVED FOR 105°C
- LOW MOISTURE ABSORPTION—LESS THAN 1%
- PERMANENT FLEXIBILITY—SMOOTH WALL FINISH
- NON-COMBUSTIBLE FOR POTTING AND SOLDERING
- HIGH DIELECTRIC STRENGTH

An expanded range of wall thicknesses provides a REL 16-A tubing for almost any tough wiring problem.

TURBO GLASS TUBING

AVAILABLE IN FOUR GRADES

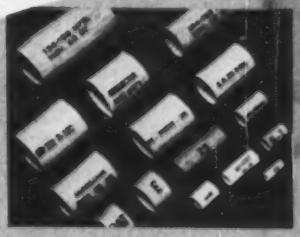
SINGLE SATURATED 1200 V. (ASTM)	TRIPLE STRENGTH 3500 V. (ASTM)
DOUBLE DIPPED 2000 V. (ASTM)	MAGNETO GRADE 7000 V. (ASTM)

- RESISTS HIGH HEAT, ABRASION — FLEXIBLE, NON-HYGROSCOPIC
- SUPER-IMPREGNATED WITH SUPERIOR INSULATING VARNISH
- MINIMUM POROSITY, HIGH DIELECTRIC STRENGTH
- CLOSE WOVEN FIBROUS GLASS YARN

Here's the *Solution* to HIGH TEMPERATURE PROBLEMS!

TURBO Fibrous Glass Tubing makes full use of the natural insulating property of GLASS—reinforced by the varnished coating to yield a nearly ideal dielectric impervious to moisture and other deteriorating influences. It is excellent where severe heat conditions or high dielectric requirements rule out ordinary insulations—especially where minimum bulk is desirable. Available in 4 grades, 28 diameters, 5 colors, 42" lengths and in continuous coils.

TURBO WIRE MARKERS



- WOVEN FABRIC MARKERS
- EXTRUDED PLASTICS MARKERS
- SLEEVE OR TAB TYPE
- CHOICE OF COLORS

TURBO WIRE MARKERS SPEED ELECTRICAL OPERATIONS!

TURBO Wire Markers are used to identify electrical conductors, or, in fact, any tubing, wiring, rod, pipe, hose, cable or connection. Dimensioned to precise limits to insure snug fit, these markers cut assembly costs wherever a multiplicity of electrical operations must be effected with speed and accuracy. Printed legend may be applied longitudinally or circumferentially in any color of ink. The tab type is especially suitable for use on finer wires. Sizes as required.

SEND FOR FREE TURBO SAMPLE BOARD! Write on your company letterhead for this valuable insulation selector. Contains actual testing specimens of TURBO Sleevings and Tubings together with data and recommendations. In various sizes and colors.

WILLIAM BRAND & COMPANY

GENERAL OFFICES: WILLIMANTIC, CONN. • 1313 W. RANDOLPH ST., CHICAGO, ILL.

from crystal set to television

LENZ has served the radio industry!

When the radio industry first appeared on the American scene 25 years or more ago, the Lenz Electric Manufacturing Co. was ready with the facilities required for the production of needed wires.

These facilities have grown with the industry, all through the days of the crystal set, right down to the present boom in Television equipment, Lenz Wires and Cables, have been used in the production of millions of electronic units of all kinds and their component parts.

Lenz will continue to be a leading source for properly engineered underwriters approved Plastic and Textile Hook-Up, Wires, Cables, Shielded Lead-Ins, and Harnesses for all types of electronic equipment, A.M., F.M., Television and Communications. Consult Lenz, now as always your source for engineered wires and cables designed for the job.

LENZ

LENZ ELECTRIC
MANUFACTURING CO.

1751 N. Western Ave. Chicago 47, Illinois

FOR BETTER TUBE PERFORMANCE

NOW—MORE THAN EVER BEFORE —ELECTRICAL ALLOYS *MUST BE BETTER*

The critical requirements of television circuits demand better tubes with finer electrical alloys — alloys that are superior electrically, chemically and in physical properties. A logical source for metals to meet these new standards is the Wilbur B. Driver Company, largest producer of carbonized nickel ribbon and filament alloys *for more than twenty years.* Inquiries concerning critical tube applications will receive prompt, capable attention. Write today, outlining your requirements — there is no obligation.

WILBUR B. DRIVER CO.

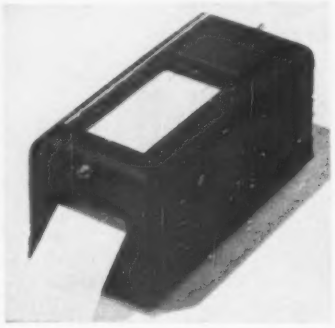
150 RIVERSIDE AVE., NEWARK 4, NEW JERSEY

BRUSH INSTRUMENTS

For Industrial and Laboratory Use

Brush Development Company comprehensive service offers you the advantages of an expertly staffed, modern electronics and electromechanical laboratory. All the skill and knowledge Brush is applying to the broad field of electronics is available for the solution of your particular design problems. Your inquiries are invited.

BL-202 DOUBLE CHANNEL MAGNETIC OSCILLOGRAPH



Complete instrument for use when 2 simultaneous recordings desired—as in synchronizing problems. Heart of oscillograph is magnetic penmotor, reproducing electrical signals in the frequency range from dc to 120 cps. 3 speed paper drive provided adequate for virtually every recording need. A hinged door in the cover permits access to inkwell, pen and chart paper for minor adjustments and notations. Entire cover may be easily removed for reloading chart paper, etc. Also supplied in a single channel model, with one BL 902 penmotor in the same chassis, known as the Model BL 201. Each model is furnished with one 2 oz. bottle of both purple and green charting ink and 6 rolls of chart paper.

Chart paper BL 202—3 15/16" W BL 201—2⅜" W 5mm. longitudinal divisions 1 mm. transverse divisions

Paper speeds 5, 25 and 125 mm./sec.

Chart Drive Motor 105-125 v. 50 to 60 cycles. 40 w. synchronous

Net wgts BL 201—20 lbs. BL 202—25 lbs.

Shipping wgts. BL-201—23 lbs. BL 202—28 lbs.

Dimensions 6⅞" H 6½" W 14⅞" L

BL-206 SIX CHANNEL MAGNETIC OSCILLOGRAPH

Consists of six magnetic Penmotors mounted in a line, recording on 12" wide chart paper. On standard units, a paper speed of either 125 mm/second, 100 mm/second, 50 mm/second or 25 mm/second plus 1/5 or 1/10 of this speed can be provided. Other speed combinations available on special units. Chart paper may be torn off or rerolled as desired. Has approximate dimensions of 20"x17"x17". Provides excellent recording medium for multiple strain gage recording, vibration analysis, wind tunnel work, etc. Either DC or AC circuits may be measured. Assures uniform frequency response and a linear phase shift with frequency. Furnished with or without AC or DC amplifiers to fit particular applications. Linear frequency response from DC to 100 cps. when used with our amplifiers.

BL-312 UNIVERSAL BRIDGE SWITCH

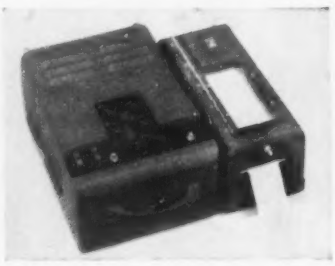
The Universal Bridge Switch has been developed to extend the range of the BL 320 Universal Amplifier. The Universal Bridge Switch permits the scanning of six channels with a maximum of four gages each through one Universal Amplifier and the BL 202 magnetic Oscillograph. One of the two channels of the Oscillograph is used to record a coded signal indicating the number of the channel being recorded at that particular time, the attenuator setting and the chart speed.

The BL 312 Universal Bridge Switch contains six separate control panels which include an attenuator, resistance balance, capacity balance, fine gain control and calibration control. A separate amplifier is included with each bridge circuit for matching purposes. A calibrating resistor is furnished with each channel which matches the SR-4 120 ohm gage but can be changed readily for the calibration of gages with other resistance values. Each of the six strain gage bridges may be individually balanced and calibrated so that no manipulation of the controls is necessary during the actual test except for the channel selector switch.

The BL 312 Universal Bridge Switch power requirements are 150 watts, 105 to 125 volts a.c. The case dimensions are 21"x13¼"x8". The unit will weigh 30 pounds.

BL-502 TRANSIENT RECORDER—Designed to record and graphically represent varied transient phenomena of 2-10 sec. or less. Transient phenomena capable of being converted into electrical impulses recorded and reproduced automatically. Such transients as vibrations, explosion waves, light flashes, welding cycles, etc. are a few that can be recorded. Reproduction repeats continuously for visual analysis by a cathode ray oscilloscope.

BL-902 MAGNETIC PENMOTOR—High speed direct-wiring element for use where instantaneous record is needed. Highly stable and accurate. Flat frequency response and linear phase shift with frequency permit accurate reproduction of both transient phenomena and steady state signals. Construction permits use under virtually any temperature or climatic conditions.



BL-320 UNIVERSAL AMPLIFIER

When used with Brush Magnetic Direct Inking Oscillograph, is a complete package unit for measurement of strains. Simply operated, producing records which are immediately available and easily interpreted. Records either static or dynamic strains up to 100 cps, and direction as well as magnitude of the measured strain can be read from the chart. Connections brought out so 1 to 4 active gages may be used. If less than 4 active gages used, dummy gages or precision resistors must be substituted for missing gages to complete bridge network. One of the dummy gages may be used for temperature compensation when one active gage is employed. Provision is made for connecting an internal calibrating resistor in the bridge circuit and adjusting the overall gain. Readily calibrated for individual gages, so that strain can be read directly in microinches per inch from the chart deflection. Can be used to record pressures, temperatures, accelerations, forces, etc., provided the equipment is calibrated in terms of the particular pickup used. The output consists of 3 stages, direct coupled, designed to match characteristics of direct inking oscillograph. This section may be used as general purpose, low gain d-c amplifier with gain and centering controls provided. May be adapted for use with Esterline-Angus or other similar graphic recorders.

Recommended gages 120 ohm type (50 to 1000 ohm gages may be used).

Range of measurable strain 10 to 40,000 microinches/inch with one active gage. (Greater sensitivity obtained when more active gages are employed.

Frequency response (when used with Brush Direct Inking Oscillograph) d-c to 100 cps.

Bridge Energizing Frequency 2,000 cps.

Output Impedance Approx. 50 ohms (Not to be loaded with less than 1500 ohms)

Power required 100 to 125 v., 60 cps., 135 w.

Dimensions 17¼ in. l. x 11 in. w. x 7½ in. h.

Weight 30 lbs.

Tubes Required 2—6SF5, 1—6C5, 1—6H6, 1—6SN7, 2—6V6, 2—VR150, 1—VR105, 1—VR75, 1—5U4GT.

BL-928 DUAL CHANNEL DC AMPLIFIER

Developed primarily for coupling external circuits to either the BL 202 or BL 202A double channel magnetic Oscillographs, where high gain is not essential. It will give simultaneous graphic records of two electric phenomena of amplitudes of 40 millivolts or more and frequency components between 0 and 100 cycles. Particularly useful in the study of battery characteristics, photocell outputs, electrolysis surveys, and characteristics of dc generators and motors. A useful tool for the experimenter as a unit for matching special amplifiers to the magnetic Penmotors, as, for example, in electrocardiograph or electroencephalograph work.

The two amplifiers are contained in a single case with carrying handle provided on front panel for ready portability. Control panel located at front of amplifier case contains a "factor of 10" attenuator, gain control and a pen positioning bias control for each amplifier. A dc calibration source is supplied in the form of an accurate standard cell.

Frequency response DC to 100 cps

Sensitivity 1 chart mm/50 mv

Stability 0.25 chart mm pen drift or less per hour

Voltage gain 25 times (approx.)

Power Requirements

95 to 125 volts
60 cycles
145 watts

Input impedance ....10 megohms

Output impedance Approx. 50 ohms must not be loaded with less than 1500 ohms

Input voltage range .05 to 200v

Output voltage 15 v (max RMS)

Dimensions 17¼" lx11" wx7½" h

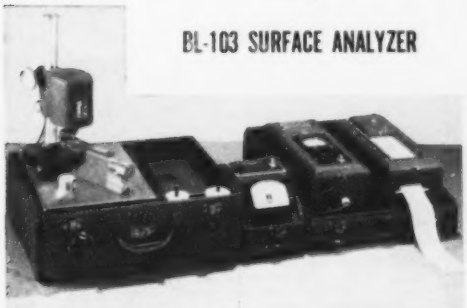
Net weight ..... 30 lbs.

Tubes required
4—6F5, 2—6V6, 4—VR-150

BL-932 D-C AMPLIFIER

Designed for use with Brush Magnetic Direct Inking Oscillograph, also used to make recordings of many types of phenomena heretofore measured only with the aid of complicated intermediate equipment. Studies of static or dynamic conditions, such as strains, displacement, pressures, light intensities, temperatures, d-c and a-c voltages or currents, and many others are simplified by the use of the Brush Direct Inking Oscillograph with the BL-932 Amplifier. Voltage gain is sufficient to give 1 chart mm deflection per mv input. Novel design features combined with both plate and heater voltage regulation reduce effects of power line fluctuation. Zero signal drift amounts to not more than 1 chart mm per hr. Frequency response essentially uniform from d-c to 100 cycles per sec. Control panel located at front contains a factor of 10 attenuator, gain control, calibrating meter and controls for determining input voltages. Balancing potentiometer provided for electrically biasing oscillograph pen to any position on the chart.

Frequency response . DC to 100 cps
Sensitivity . . . . .1 chart mm mv
Stability . . . .1 chart mm pen drift or less per hr.
Voltage gain . . . 1000 times (Approx.)
Power requirements . .105 to 125 v 60 cycles 125 w
Input Impedance . .10 meg
Input voltage range .001 to 200 v
Dimensions 17¼" long x 11" wide x 7½" high
Net Wgt. 34 lbs.
Shipping wgt. 38 lbs.
Balancing control . Helipot (10 revolutions)



BL-103 SURFACE ANALYZER

For exploration, and instantaneous charting of surface finishes—metals, glass, plastics, paper, plated and painted surfaces from less than 1 to 3000 microinches. Complete with PA-2 Pickup Arm, Drive Head, Amplifier, Magnetic Oscillograph, Surface Plate, Carrying Cases, Glass Calibration Standard, 2V Blocks, 6 rolls Chart paper, one 2 oz. bottle Red ink, connecting cords and operating instructions. BRUSH "RMS" METER: "average reading" type calibrated in terms of the "RMS" value of an equivalent sine wave. Provides constant visual check of "RMS" surface roughness where "hill and dale" chart profiles are not needed. Convenient to read because of large illuminated dial. "RMS" Meter may be purchased separately or with Surface Analyzer.

ROUGHNESS RANGE—½ to 125 microinches (may be extended)
POWER REQUIREMENTS—105 watts, 105-125 volts, 50-60 cycles
DRIVE HEAD—Model DA-2
  STROKE—1/16" reciprocal .0125" per second
  Complete Cycle—10 seconds. Height Adjustment—7 inches
PICKUP—Model PA-2
  Roughness Range—½ to 125 microinches "RMS"
  Exploring Stylus—Diamond, .0005" tip radius
  Minimum Bore—.250" dia. x .750" depth
  Maximum Penetration—4" for dia. 1.125" or greater
CALIBRATING AMPLIFIER
  Maximum Voltage Gain—2000 times
  Input Voltage Range—.001 to 300 volts
  Maximum Output Voltage—22 volts peak. Input Impedance—10 megohms
MAGNETIC OSCILLOGRAPH—Model BL-201
  Frequency Response—¼ to 120 cps with BL-905 amplifier
  Chart Speeds—5, 25, 125 mm. per second. Chart Drive—Synchronous Motor
MODEL BL-106 "RMS" METER
  Scales—3 and 10 microinch
  Frequency Range—¼ to 120 cps
  Circuit—Rectifier type meter reads true "RMS" value of a Sinusoidal input signal.

BL-314 UNIFORMITY ANALYZER

An electronic instrument designed to measure and make a permanent record of irregularities in weight per unit length of yarn, roving, and sliver. As the material to be measured is passed continuously through the measuring head, the cotton count at any given point or the average cotton count is shown on the Cotton Count meter and a running record graph is drawn automatically by the recorder. The instrument is calibrated for cotton but, with only minor changes, may be adapted for wool, nylon, rayon, and various plastics. Since material being tested is not touched during measurement except by the guide eyelets and feed rolls it is not compressed or distorted. Thus, after testing, material may be subjected to further processing or other tests. Record graphs obtained may be evaluated to give a numerical value to the uniformity of the material. This numerical value is independent of the even moisture content of the sample.

Supply voltage . . . . . 110-120V AC
Power 200W
Weight . . . . . 90 lbs.
Dimensions . . . 12" by 15" by 22"
Incorporates automatic voltage regulation.
Range of cotton materials—Measuring slot I . . . .08 to 1.5 Cotton Count
  Slot II . . .8 to 15 Cotton Count
  Slot III . . 8 to 150 Cotton Count
Speed of measurement—2 motor drives supplied:
  Drive I . yarn . 5 ft. per sec.
  Drive II . roving, sliver . . 6 in. per sec.
  Recorder Speeds . 5, 25, 125 mm per sec.
Package handling—yarn may be run from cones, cheese, tubes, and bobbins. Roving may be run from bobbins and sliver from cans. Package holders, guides and tension are supplied.

BL-809 REGULATED FREQUENCY POWER SUPPLY

Designed to meet the need of a constant frequency power supply up to 60 watts output that is independent of the primary power frequency. The prime purpose of the unit is to operate fhp synchronous motors at a fixed speed. Comes equipped to furnish a 60 cycle output but other output frequencies may be supplied on special order. The input power requirements are 105 to 125V, 45 to 2000 cycles per second, without adjustment. Attention has been given to the waveform of the output and by means of heavy feedback through a loop including the output transformer, the wave form is substantially sine wave at any output up to full rating. Voltage regulation of 10% permits using the unit with any loading from zero up to full capacity without adjustment. Designed for continuous unattended operation at any load rating from 0 to 60W. Frequency stability of the unit is given by a temperature compensated tuning fork, with specified frequency accuracy of one part in 100,000 and a factory setting to one part in 1,000,000.

Input Power Requirements . 105-125 V. 45-2000 cycles. 165W unloaded. 250 W loaded.
Output . 115V 60 cycles. 40-90 cps tuning forks on special order. Output frequencies up to 1,000 cps may be had by changes in circuit components on special order.
Wave Form . Essentially sine wave within rated load.
Voltage Regulation . 10%.
Frequency Stability . . .001% at 25°C.
Temperature Coefficient . 2 parts per million per degree centigrade.
Circuit . Power amplifier driven by tuning fork controlled multivibrator.
Weight . 90 lbs.

The BRUSH DEVELOPMENT CO. 3405 PERKINS AVENUE CLEVELAND 14, OHIO, U.S.A.

CHATHAM ELECTRONIC TUBES and EQUIPMENT

Tubes listed on this page can be supplied direct from stock. Many other types are also available for immediate delivery. Write for catalog today. CHATHAM also designs, develops and manufactures special tubes to exact customer specification. Inquiries regarding this service are invited.

CHATHAM 2D21 THYRATRON

A Xenon filled shield grid thyratron for grid controlled rectifier service. Permits use of high resistance in the grid circuit. Heater 6.3 volts .6 amp.... Inverse peak plate voltage 1300 volts, 100 ma. average plate current.

CHATHAM 5594 THYRATRON

Xenon filled thyratron. Operates through ambient temperatures from —55° C to +90° C without auxiliary equipment to maintain bulb temperature. Fil. 2.5 volts, 5.0 amperes... Peak inverse 5000 volts; anode current 0.5 amps. average, 2.0 amps. peak.

CHATHAM 884 THYRATRON

An Argon filled thyratron for use as a sweep circuit oscillator in cathode ray tube circuits. Stable oscillator. Heater 6.3 volts, 0.6 amp.... Peak forward plate voltage 300 volts, 75 ma. average plate current.

CHATHAM 1B46 REGULATOR

A cold cathode glow discharge tube designed for voltage stability. D.C. operating voltage 82 volts —operating current range 1 to 2 mAdc.

CHATHAM 4B32 RECTIFIER

A rugged half wave Xenon filled rectifier. Operates in any position throughout an ambient temperature range of —75° C to +90° C Fil. 5 volts, 7.5 amp.... Inverse peak anode voltage 10,000 volts, 1.25 amp. average anode current.

CHATHAM 866-A RECTIFIER

A rugged half wave Mercury Vapor rectifier to withstand high peak inverse voltages. Heavy duty filament. Fil. 2.5 volts, 5.0 amp.... Peak inverse anode voltage 10,000 volts, .25 amp. average anode current.

CHATHAM 1B3GT RECTIFIER

High voltage vacuum rectifier for Television and similar applications. Low filament power permits efficient operation from R.F. supply. Filament 1.25 volts, 200 ma. . . . Inverse peak plate voltage 30,000 volts, 2 ma. average plate current, 17 ma. maximum plate current.

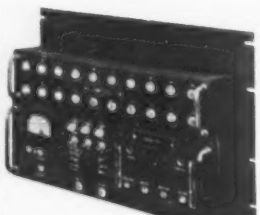
CHATHAM 3B28 RECTIFIER

This rugged half wave Xenon filled rectifier will operate in any position and throughout an ambient temperature range of —75° C to +90° C Fil. 2.5 volts, 5.0 amp.... Inverse peak anode voltage 10,000 volts, .25 amp. average anode current.

CHATHAM 1Z2 RECTIFIER

A small bulb high voltage vacuum rectifier. Low cathode heating power and low dielectric losses make tube suitable for radio frequency supply circuits. Fil. 1.25 volts, .265 amp.... Inverse peak plate voltage 15,000 volts, 2 ma. average plate current, 10 ma. peak plate current.

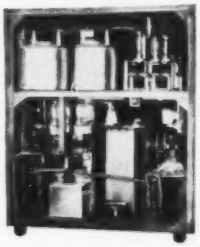
CUSTOM BUILT ELECTRONIC EQUIPMENT



• Pulse life test equipment built by CHATHAM checks receiver type tubes under pulse operating conditions.

CHATHAM specializes in the development, design, and construction of custom-built electronic equipment to exactly meet customers' requirements. Our capable staff of engineers will furnish prompt estimates or, if desired, will call to discuss your problem personally. Call or write today for complete information.

Write today for the informative CHATHAM catalog. For free copy address requests on company letterhead — no obligation.



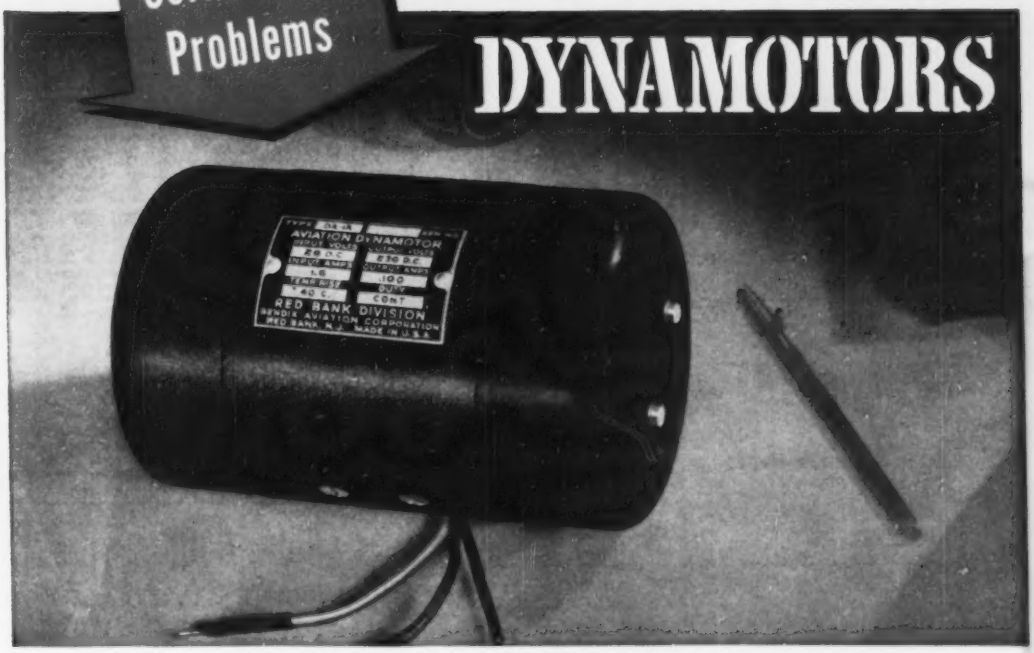
• 5 Megawatts radar modulator built by CHATHAM to rigid government standards.

CHATHAM ELECTRONICS · INC

475 WASHINGTON STREET, NEWARK 2, NEW JERSEY

Let *Bendix* Solve Your Problems

SPECIALIZED DYNAMOTORS



. . . Promptly and at Moderate Cost!

Bendix dynamotors are built to supply the *exact* power requirements of your equipment—to work from any input voltage and to deliver the necessary power at any output voltage. Dual or triple output voltages are available for high and low-level portions of the circuit, or for biasing. For critical circuits, regulated outputs will simplify your design problems, especially since a regulated filament supply can be obtained as a bonus when regulating the high voltage output. Bendix will build your dynamotors to the usual military specifications or to meet even more rigid requirements, such as operation at higher temperature, or altitudes in experimental equipment.

Samples or production units of special dynamotors are priced competitively. A definite proposal will be made upon receipt of the details of your problem. For immediate information call our Engineering Staff—Red Bank 6-3600, Red Bank, New Jersey.

THE RIGHT DYNAMOTOR FOR EVERY PURPOSE

- Sizes—2¾" to 5¼" diameter
- Power Range—10 to 500 watts
- Input Voltage—6 to 115 volts
- Output Voltage—6 to 1500 volts
- Single and multiple output and input
- Plain and regulated types

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Illinois condensers

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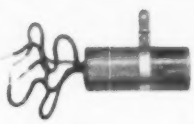
AM-FM-TV

Here's a complete line of condensers that are the ultimate in dependability — condensers that are famously long-lived! Once you have tried Illinois condensers you, too, will join the ever-increasing numbers who consistently specify Illinois condensers for every electronic application.

Type IHT

ILLINI-HYCAPS ELECTROLYTIC CAPACITORS

Rugged, dependable tubular aluminum can with outer insulating sleeve. Short proof hermetically sealed, low leakage, excellent shelf life, provide extremely long, quiet, stable operation. All types. Working voltages 5 to 500 DC.



Type IHC

CLAMP MOUNTING TUBULAR ELECTROLYTICS

Built for long life under severest operating and climatic conditions. Common negative or multiple negative units. All types. Working voltages 150 to 500 DC.

Type UMP

ILLINOIS TWIST PRONG MOUNTING CONDENSERS

Wider range of voltage and capacity types than heretofore possible in units of comparable size. Capacities always plus, low power factor, low leakage. Hermetically sealed. All types. Working voltages 6 to 600 DC.

Type LN

ALUMINUM CAN CONDENSERS

(Inverted Screw Mounting)
Built to operate under severest conditions. Design permits maximum heat dissipation, higher temperature and voltage surges. All types. Single and dual units 450 to 600 DCWV

Our engineers are available to help design and build in production quantities special types to meet your needs.

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ILLINOIS CONDENSER CO.

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Export offices: Leonard L. Minthorne Co., Inc., 15 Moore St., N.Y.C.

WIDE RANGE ULTRA-LOW FREQUENCY

OSCILLATOR • Model 410-A

FREQ. RANGE: 0.02 to 20,000 cps. continuously variable in six decade bands. • FREQ. DIAL: Single scale, illuminated, direct reading, engraved logarithmically from 1.8 to 22 on an 11" scale, controlled by a 5/1 vernier. FREQ. ACCURACY: Calibration ± 4%, drift including initial warm up is less than 1%, drift with ± 10% change in line voltage is less than ± .01%. • OUTPUT VOLTAGES: Square wave —10 v peak to peak ± 5%, Sine wave —5 v. rms. maximum, adjustable continuously by a "T" pad, and in steps, by a switch providing attenuation ratios of 100:1, 10:1, 2:1 and 1:1. • OUTPUT IMPEDANCE: Square wave —5000 ohms, Sine wave —500 ohms, both constant. SINE WAVE • AMPLITUDE: Varies less than ± .025 db (3%) over the entire frequency range from 0.02 to 20,000 cps. • DISTORTION AND HUM: Less than 0.25% over entire frequency range from 0.02 to 20,000 cps. • SUB-SONIC RECOVERY TIME: Recovers to 90% of its steady state amplitude in less than 3 cycles of the dial frequency, after band-switching or similar disturbances. FORM: Standard rack panel, overall dimensions; 21" wide, 10" high, 12" deep, Weight—50 lbs.

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OTHER LOW FREQUENCY INSTRUMENTS: Tuneable band pass filter • Servo filter • Tuneable Rejection filter • Vacuum tube voltmeter • Phase meter

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- —pulse integration
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If you are designing circuits requiring a time delay element, or a reliable relay where a short operating interval can be tolerated, it might be to your advantage to consider the Edison 501 Thermal Relay.

Here are 7 good reasons why:

1. Vibration and shock resistant – Guaranteed to withstand continuous vibration of 1/16" over-all amplitude at 55 cps., and impact shock of 50 g.

2. Chatter-proof – Pre-loaded spring provides 50-gram pressure almost instantaneously, for sure, positive operation.

3. Non-position sensitive – Characteristics not affected by mounting angle – operates satisfactorily in any position. Standard intermediate octal base.

4. Ambient compensated – Automatically compensated for ± 60° C. ambient range by extra unheated bimetal. Will operate from −60° C. to +100° C.

5. Non-arcing – Sealed-in-glass. Operates in its own arc-suppressing atmosphere. Withstands substantial currents and voltages without arc-pitting.

6. Explosion-proof – Hermetically sealed. You can specify it for safe use in corrosive or hazardous fumes and dusts. Tamper-proof, too.

7. Fungus-resistant – Available with fungus and salt-spray resistant micanol base.

GENERAL SPECIFICATIONS — STANDARD TYPES

Operating Time—5 to 300 sec., in 14 standard intervals, pre-set at factory.

Contacts—Silver, SPST normally open.

Contact Rating—Types 5 sec. to 75 sec., 3 amp. 150 v.dc. or 250 v.ac. Types 90 to 300 sec. 3 amp. 450 v. ac./dc.

Heater—5 watts, 117 v. 26.5 v., 6.3 v., dc. or ac to 2400 cps.

Size—1.275" max. dia., 3.250" max. seated height (standard T-9 envelope).

Weight—1¼ to 2¼ ounces.

Other than standard types can be made up on special order to meet requirements for other heater voltages, higher currents, etc.

LITERATURE AVAILABLE

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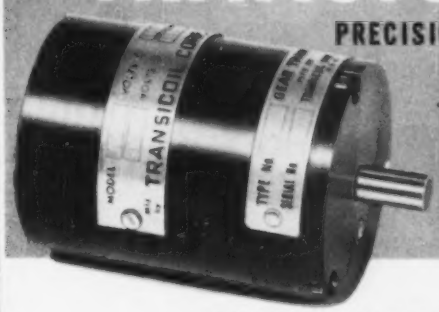
PRECISION COMPONENTS TO *Your* SPECIFICATION



CONTROL MOTORS

60-400 cycle, two phase operation. Stall torque range: 15 to 7.5 In. Oz. Most of these are available for plate to plate operation . . . designed and produced to fulfill the requirements of your particular application. Write for Bulletin M.

PRECISION GEAR TRAINS

Especially designed for use with Transicoil Units. Through this unique design, Transicoil Gear Trains make it possible to achieve unusual miniaturization and still fulfill your requirements. Gear trains designed to your specifications also available. Write for Bulletin T.

INDUCTION GENERATORS

Designed for operation in electronic equipment in which a variable voltage output must be proportional to a shaft speed having the same frequency as the supply. Output voltage is linear over an extended range. Low residual voltage, as a function of the design, enhances the performance of associated components. Induction generators also furnished with motor gear trains as a complete assembly when desired. Write for Bulletin G.

SERVO AMPLIFIERS

Engineered for use with plate to plate control motors; provide all the circuitry needed in the error signal path. Two types available: one for circuit checking, another for production. You specify phase voltage, gain, reduction rate, phase shift, etc. We confine standardization to physical dimensions only. Write for Bulletin A.

A LOAD OFF YOUR SHOULDERS ONTO OURS

The policy of Transicoil has always been never to restrict your design possibilities. We ask you to cite the requirements of the unit you want, and we'll build a unit to meet those requirements. Thus, you have a complete factory at your service, ready to produce the precision components you need, very much like a division of your own company—only at a cost and with experience better than you can probably realize in your own plant.

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107 Grand Street New York 13, N. Y.

MARION

means the *most* in meters

Series HS

New MARION *RUGGEDIZED* METERS HERMETICALLY SEALED

Series HS

Standard 1½", 2½" Mr 26 Series, 3½" Mr 36 Series, and 4½" sizes. Extremely accurate and sensitive in any application, even under critical conditions of Shock, Vibration, Mechanical Stress, Strain, Weather Conditions and Climate. Gives faster response time, more sustained accuracy, lower bearing friction and longer life. Meet dimensional requirements of JAN-1-6. Completely interchangeable with standard 2½" and 3½" types.

Series HM

SEALED LIKE A VACUUM TUBE FOR GUARANTEED PERFORMANCE

Magnetically shielded. 2½" & 3½". Hermetically Sealed. Unaffected by heat, cold, humidity, giving peak performance with critical accuracy. Interchangeable round and square colored flanges for different panel needs. One year unconditional guarantee on materials and workmanship. Extra guarantee for replacement of burned out or abused hermetically sealed meter. (On flat fee basis, $1.50 for 200 microamps upward; $2.50 if more sensitive than 200 microamps.)

Large, 4½" × 4½". Gives critical readability on 100° scale. Alnico V magnets for sensitive range; heavy Alnico for standard ranges. Extreme accuracy assured. Designed for permanent and portable test equipment.

Marion Null Indicators are extremely sensitive shaded pole piece D'Arsonval type galvanometers. They are used primarily as bridge and potentiometer balance indicators and in any application where an instrument with very high sensitivity about the zero or balance point is desired. We particularly recommend Types HM2 and HM3 because they are hermetically sealed instruments which completely shield the galvanometers from the effects of moisture and dirt, and external factors. Ideal for use in discriminator alignment of FM receivers and as general laboratory balance indicators.

Space saver, yet has superior damping characteristics. Available in standard 2½" square (Model 52S). Dependable, extra strong — has well-aged Alnico magnet and heavy flanged construction. Popular for pocket test, portable radio, medical equipment and general electrical service where size and dependability count.

HM 2 HM 3

Model 55

Null Indicators

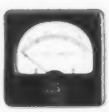
Model 52N

Model 56

New 6½" × 5¼" bakelite cased meter. Easy reading at a distance. Large open face has 100° scale in 5½" arc. Room for multirange scale if needed. Milliamp ranges are Alnico II constructed, Alnico V for microamps. Strong, accurate, efficient, dependable.

Model 57S

Superb milliameter — more than a mere overgrown 3 incher. 8½" × 7", open face, extra long scale. Enlarged pole shoes — higher torque movement — higher damping factor. Accurate within 1%. Used in large vacuum tube voltmeters, multitesters and production testing.



Model 53SN

Standard commercial 3½" rectangular type. Also available in 3½" JAN Spec., round case. All Alnico construction. Excellent scale distribution characteristics. Ideal for portable test equipment and general electronic equipment application.

A Special Marion Service

In addition to manufacturing the finest standard electrical indicating instruments money can buy, Marion will design, engineer and manufacture precision products to meet your most exacting requirements. Let Us quote on your specifications. Write the Marion Electrical Instrument Company, 402 Canal Street, Manchester, New Hampshire.

M·E·I **marion meters**

MARION ELECTRICAL INSTRUMENT COMPANY 402 **Canal Street, Manchester, New Hampshire. Export Division, 458 Broadway, New York 13, U.S.A., Cables MORHANEX. In Canada: The Astral Electric Company, 44 Danforth Road, Toronto, Ontario**

For Every Electronic Wiring Need

SPECIFY "Rome"

More and more electronic equipment and appliance manufacturers are looking to Rome Cable for their wiring requirements. In Rome Cable they have found dependable and courteous service, plus quality of product, backed by unexcelled research and manufacturing facilities. Based upon experience you, too, can look to Rome Cable with confidence. If you have a special application problem, why not let a Rome Cable engineer solve it for you? We will welcome the opportunity.

Rome Synthinol and Rome Hi-Temp

Exceptionally dependable hook-up or small appliance wires are made with Rome Synthinol* thermoplastic insulation. Being a polyvinyl chloride compound, Rome Synthinol is impervious to oils, acids, alkalies, moisture and flame. Regular Rome Synthinol conforms to all requirements of Underwriters' Laboratories for 300 and 600 volt ratings and is approved for 80° C. operation.

A new Rome Cable development is Rome Synthinol No. 901, a resin plasticized polyvinyl chloride compound. Wires insulated with this compound are Underwriters' approved for temperatures up to 90° C., for 300 and 600 volt services, and possess outstanding advantages as follows:

- Much greater resistance to heat deformation.
- Heat aging properties which enable continuous operation at 90° C.
- High suitability for coil lead applications where baking cycles often produce brittleness, shrinkage and cracking of more conventional compounds.
- Improved solderability with minimum tendency of insulation flare or shrinkage.
- Improved resistance to oils and chemical solvents.

Rome Hi-Temp hook-up and appliance wires are rubber insulated and possess high resistance to heat and moisture. They are approved by Underwriters' Laboratories for 75° C. appliance lead wire use at 300 and 600 volt ratings.

Both Rome Synthinol and Rome Hi-Temp are available in a wide range of colors, either plain or braided, with protective coverings of nylon or lacquer.

Rome Special Electronic Wires and Cables

Abetted by increasingly wider use of such thermoplastic materials as polyvinyl chloride, polyethylene and nylon, Rome Cable has introduced a number of special constructions having application in radio, television and other electronically operated devices.

MILITARY TYPES

A wide range of Army-Navy approved electronic wires, conforming in every respect to joint military specifications, are manufactured. Types for which Rome Cable has specific approval are as follows:

SPECIFICATION JAN-C-76
Types SRIR, SRHV and WL

SPECIFICATION MIL-C-915
Types SRI and SRIB

OTHER TYPES

In addition, a variety of wires and cables for electronic use are available as listed below:

- TELEVISION CAMERA CABLE
- MICROPHONE CABLES
- INTERCOMMUNICATION CABLES
- RADIO FREQUENCY TRANSMISSION LINE
- SUPERVISORY CONTROL CABLES
- FLEXIBLE CORDS

*T. M. Reg.

It costs less to buy the best ... buy Rome Cable

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From Bar to Finished Wire

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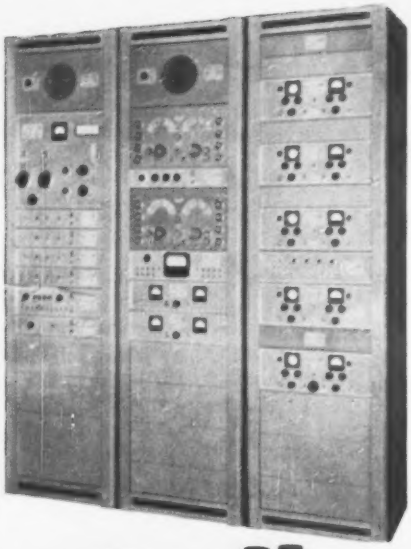


NORTHERN RADIO COMPANY

A COMPLETE LINE OF HIGH QUALITY COMMUNICATIONS EQUIPMENT

- Radio Multiplex Systems
- Multi Channel Tone Systems
- Diversity Receivers
- Standard Frequency Shift Keyers
- Low Frequency Shift Keyers
- Frequency Shift Converters
- Tone Filters
- Tone Keyers
- Demodulators
- Line Amplifiers
- Master Oscillators
- Monitors

RADIO MULTIPLEX SYSTEM

Multi-Channel Equipment for Standard Communications Frequencies. Adapts existing transmitting and receiving facilities for radio multiplex.

The system illustrated is a four-channel unit, used for transmitting and receiving radio tele-printer, telegraph or other similar low speed keying intelligence, where a limited assigned carrier band-width may be utilized. The two bays at the right are the complete receiving units; left, the transmitter terminal and exciter facilities. The system may be adjusted for band widths of 3 to 12 kc and is intended to take advantage of periods of time where propagation conditions give signals which are better than the minimum required for one channel of normal frequency shift operation. Simple operation of key switches will insert as many channels as the conditions permit. These switches automatically maintain the pre-set bandwidth regardless of the number of channels in use. The system also provides front panel switching to standard 850 cycle frequency shift operation. However, experience indicates that when propagation conditions permit frequency shift operation, they will usually allow at least two channels of multiplex.

TYPE 107 MODEL 2

FREQUENCY SHIFT CONVERTER

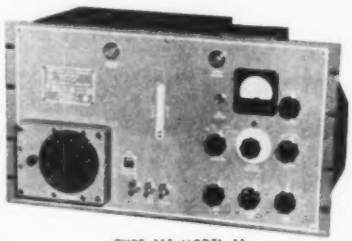
A dual channel unit, used with frequency shift receiving systems to convert the mark and space tones from the output of single or diversity receivers, into DC pulses capable of operating a tele-printer, tape recorder or other device so operated. Also used as a demodulator when receiving make and break CW or ICW signals.

2" oscilloscope tuning pattern indicates proper receiver adjustment of both mark and space frequencies, either during initial setup or under actual keying conditions. This pattern and a specially designed discriminator, coupled with a high degree of limiting, make it the outstanding performer in its field.

INPUT FS LIMITS 100 to 1000 cps frequency shift. Mark frequency set at 2975 cps.
CW ICW INPUT 400 to 7500 cps.
KEYING SPEED Up to 600 w.p.m.
OUTPUT 1. Neutral DC pulses. 60 ma in 1800 ohm external load. One side grounded.
2. Polar DC pulses ± 30 ma in 1800 ohms load. Center grounded.
3. May be operated into any impedance from 100 to 100,000 ohms.

VARIABLE MASTER OSCILLATOR

Principally used in diversity reception to supply local common oscillator injection voltage to receivers. Crystal oscillator for BFO. The Variable High Frequency section gives stability equivalent to that of non-temperature controlled crystal oscillators. It is also equipped with three crystal controlled frequencies for operation of receivers on a fixed frequency basis. The variable high frequency oscillator is provided with local crystal oscillator for spot checking of twenty points within its range.

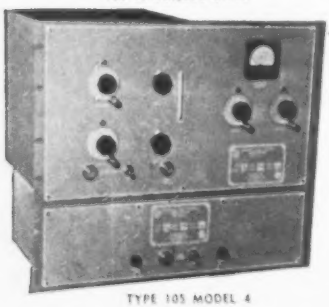


TYPE 115 MODEL 11

TECHNICAL DATA

Variable HFO output frequency	2–32 mcs continuous
Fixed Frequency crystals	2–4 mcs for output frequencies of 2–32 mcs
Output impedance	72 ohm coaxial cable
Output level	2 watts 2–4 mcs; 0.5 watts 4-32 mcs
Variable HFO Stability	20 cps per mc for ambient change of ±25° C. 5 cps per mc for ±10% Line Voltage 20 cps per mc for resetability 20 cps per mc for readability

This unit can also be used as a transmitter exciter or for laboratory measuring purposes.



TYPE 105 MODEL 4

FREQUENCY SHIFT KEYER incorporates the following outstanding features:

1. Frequency shift dial adjusts "mark" and "space" frequencies equally above and below the carrier position, which remains fixed.
2. Simplified frequency setting permits only the upper side band tuning indication to be visible on the meter over substantially a-1 of tuning range.
3. Direct reading frequency calibration of shift from 0 to 1000 cycles.
4. Direct reading frequency calibration of mixer and output tuning dials from 2.5 to 6.7 mc.
5. Direct reading of calibration of output frequency vernier ± 600 cycles.
6. Pulse shaping circuit to permit operation within assigned bandwidth with no adjacent channel radiation.
7. Highly stable temperature controlled oven with temperature control of ± 0.1° C. at 60° with heaters on 4 sides of inner oven.
8. Component ratings according to JAN Specs provide greater assurance of trouble-free operation.

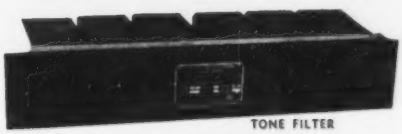
DUAL DIVERSITY RECEIVER

MODEL 2 TYPE 110

Used for dual spaced diversity reception in high speed radio tele-printer, telegraph or telephone service, using any common modulation, such as FS, CW, ICW, phone, etc. Complete receiver is housed in a rack type, fully enclosed cabinet. Provided with specially modified receivers, monitor speaker, IF monitor, master crystal oscillator, and the necessary patching arrangements. Can be supplied with any combination of terminal equipment for reception of radio tele-printer, undulator tape and program service, or for remote use where the intelligence is transmitted via landline or UHF link.

Receiver is shown with terminal equipment as recommended for general communications usage. The units are (top to bottom) Monitor speaker, Receiver #1, variable Master Oscillator, Receiver #2, Patching Panel, IF Monitor, Converter, Tone Keyer, Blank panels. For special features of this receiver see individual units described on this and the preceding page.

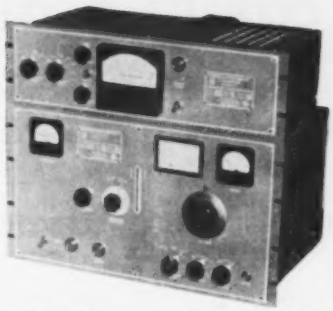
LINE AMPLIFIER



TONE FILTER

TONE KEYER

TONE DEMODULATOR



FREQUENCY AND SHIFT MONITOR SYSTEM

This system consists of a Type 106 Frequency and Shift Monitor and a Type 127 Frequency Meter. The system is designed as a secondary standard to monitor the frequency and amount of shift of transmitter carrier outputs. It is particularly intended to measure the frequency shift of a mark and space (F.S.) signal either when setting up for traffic or under normal keying conditions. The Monitor unit consists of a highly stable temperature controlled crystal oscillator with provision for selecting any one of eight crystals, a harmonic generator, a detector and an audio amplifier. The audio output frequency is read on external audio frequency meter, Type 127.

FREQUENCY RANGE	2.5 to 30 mcs
FREQUENCY SHIFT RANGE	30 to 15,000 cps
RF INPUT LEVEL	100 millivolts min.
OVEN TEMPERATURE	60° ± 0.1° C.

TONE CHANNELING SYSTEMS

With the advent of continually growing demands for tone channelizing equipment, a number of systems and basic units have been added to our standard line in order to meet the many and varied customer requirements in this field. These systems are available from 1 to 18 channels as stock units using standard tone frequencies of 255, 425, 595, 765, 935, 1105, 1275, 1445, 1615, 1785, 1955, 2125, 2295, 2465, 2635, 2805, 2975 and 3145 cycles. Units can be furnished in either 340 or 170 cycle separation groups, depending on number of channels and keying speeds required. They are available as either amplitude on-off, or frequency shifted tone systems. Complete details on any specific requirements are available on request.

Illustrated here is a representative group of these units, most of which are of compact construction, permitting installation of many channels per rack.

These units each contain their own power supplies, allowing complete flexibility in selection of channels and systems. This feature also keeps initial costs of small installations at a relatively low level compared with systems using large common power supplies.

Units can be furnished to function with any common input source such as contact, polar contact, ± DC voltage pulses, ± DC current pulses, polar DC voltage or current, tone pulses, etc. Outputs are available for direct teleprinter operation using DC polar or neutral pulses or, when desired, relay or other output can be provided.

These systems are equally applicable to land line or radio link systems. Complete package systems can be prepared to meet any specific or special requirement.

COMPLETE CATALOG OR SPECIFICATION SHEETS ON REQUEST

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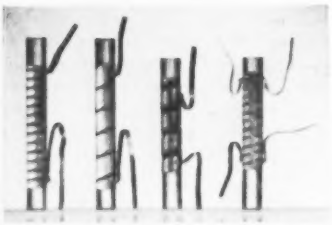
CORNING GLASS WORKS

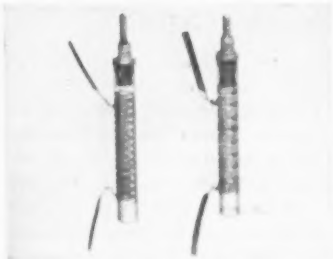
Electronic Sales Department — Electrical Products Division

CORNING, N. Y.

METALLIZED GLASS INDUCTANCES, CAPACITORS, BUSHINGS— TELEVISION TUBE BLANKS

CORNING HIGH FREQUENCY INDUCTANCES



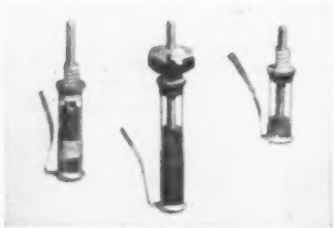


Designed to meet the need for high quality, economical inductances for F. M. and Television tuning applications, Corning Metallized Glass Inductances will satisfy your most stringent requirements. They have high temperature stability and low loss, and contribute negligible drift characteristics even under unusual temperature changes.

Corning Inductances can readily be supplied to accurately meet individual specifications in uniform, variable or double pitch windings. They are available as fixed tuned, permeability tuned or permeability tuned inductance-trimmer combinations. Corning Inductances of a given type can be duplicated within very close tolerances in any quantity.

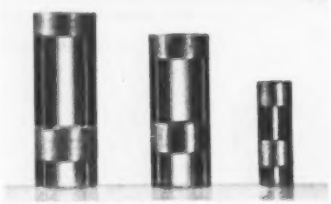
Easily installed by conventional soldering or grommet mounting, these inductances can be supplied solder-spotted or with leads as desired. Rugged and durable, they stand repeated handling. Corning Inductances meet today's top quality requirements at the lowest possible cost, as in many instances the use of these stable inductances eliminates the need of including additional stabilizing components in the circuit.

CORNING MIDGET TRIMMER CAPACITORS



Corning Metallized Midget Trimmer Capacitors are especially suitable for high frequency work where co-axial trimmers are desirable. Small in size, they save important space. The near zero temperature coefficient insures stability under wide temperature changes. A 4/40 thread makes fine adjustments possible. Corning Midget Trimmer Capacitors are designed to fit your requirements for a stable trimmer capacitor of small size.

CORNING HERMETICALLY SEALED BUSHINGS



Corning Metallized Glass Bushings provide high quality hermetically sealed terminals for high voltage transformer and capacitor applications. Reliable and accurate, they are moisture and dust-free. Ease of installation reduces production costs. Although a complete standard line is available, special designs can be made to individual requirements.

STANDARD SIZES

O. D. and Length	O. D. and Length
$\frac{3}{16}$" x $\frac{21}{32}$"	$\frac{1}{2}$" x $1\frac{13}{32}$"
$\frac{3}{16}$" x $1\frac{5}{32}$"	$\frac{3}{4}$" x $1\frac{13}{32}$"
$\frac{5}{16}$" x $\frac{21}{32}$"	$\frac{3}{4}$" x $2\frac{5}{32}$"
$\frac{5}{16}$" x $1\frac{5}{32}$"	$\frac{3}{4}$" x $3\frac{5}{32}$"
$\frac{1}{2}$" x $1\frac{5}{32}$"	1" x $3\frac{5}{32}$"
$\frac{1}{2}$" x $1\frac{13}{32}$"	1" x $4\frac{5}{32}$"

CORNING TELEVISION TUBE BLANKS

Corning Television Tube Blanks are made of strong, lightweight, lead-free glass with electrical properties ideal for television reception. They are produced automatically to uniformly close tolerances in both round and rectangular design. One-piece construction of neck and funnel provides additional strength. This also improves alignment, eliminating neck shadow and interference with yoke assembly. Large face plates are electrically sealed to prevent distortion, boiling or unsightly variations and again increase overall strength. Round T. V. bulbs—$8\frac{1}{2}$", 10", $12\frac{1}{2}$", 16" and 19" in diameter; rectangular 14", 16" and 20" diagonal.

TECHNICAL SERVICES

Specialists in glass working, quality control, product engineering or design are available to tube and set manufacturers on glass problems.

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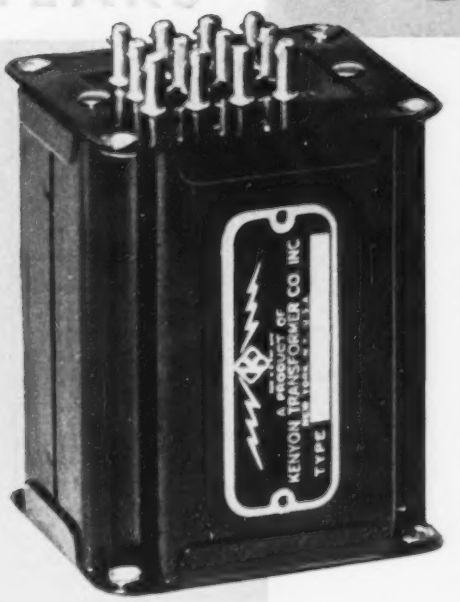

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BH6	SR5	MC9	TCO-1
FREQUENCY 200—600 kc 1.0 to 100 mc	FREQUENCY 600—15000 kc	FREQUENCY 2500—15000 kc	TEMP. CONTROLLED OVEN FOR BH6 UNIT
DIMENSIONS HIGH WIDE THICK exc. pins 25/32 3/4 11/32	DIMENSIONS HIGH WIDE THICK (exc. pins) 1 1/4" 1 9/64" 7/16"	DIMENSIONS HIGH WIDE THICK exc. pins 1 11/64" 13/16" 7/16"	DIMENSIONS 1 1/4" Diameter 1 1/2" High (exc. pins)
PIN SIZE & PIN SPACE .050" .486"	PIN SIZE & PIN SPACE .125" .500"	PIN SIZE & PIN SPACE .093" .486"	STANDARD OCTAL BASE
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ULTRASONICS:
Quartz blanks produced to customer specifications for ultrasonic application or research. Material carefully processed to individual requirements.

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Fused quartz delay lines custom built to specifications.

PACKAGED OSCILLATORS:
Crystal oscillator sub-assemblies designed and produced for commercial UHF equipment.

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UNION STATION BUILDING • ERIE, PENNSYLVANIA

The Development of CARBONYL IRON POWDERS

Carbonyl Iron Powder is an extremely pure form of iron, the metal content being over 99.99% iron, produced in the form of almost perfect spheres only one to fifteen microns in diameter—the average diameter being 8 microns (.00032 inches). It has been produced commercially for some years, primarily for use in magnetic cores for electronic equipment. Its production is therefore now under perfect control to give absolute reliability in quality and properties.

The production of Iron Carbonyl, from which Carbonyl Iron Powders are made, depends on a unique reaction, which was discovered in 1890 by the distinguished British chemist, Sir Ludwig Mond. When iron is treated with carbon monoxide it reacts to form iron pentacarbonyl, a rare case of a liquid compound of a metal. Each atom of iron combines with five molecules of carbon monoxide to give a compound with the formula $Fe(CO)_5$. This reaction leaves behind any impurities in the original iron.

This liquid is vaporized and the vapor heated above 200°C, when it decomposes into its constituents. The carbon monoxide is driven off and the iron separates from the vapor phase, first in the form of free atoms, then as ultramicroscopic crystals, finally as microscopic, almost perfect spheres. The particle size distribution can be controlled by temperature, pressure and other operating conditions.

Controlled purity and distribution of particle size is essential for use of the powder in electronics, where minor variations in these properties have exaggerated consequences in delicate electrical and magnetic effects.

The only other elements present are non-metals such as carbon, oxygen and nitrogen. In G A & F Carbonyl Iron Powder, they amount to not more than 0.8% carbon, 0.9% oxygen and 0.7% nitrogen.

The first large-scale production of Iron Carbonyl was undertaken in Germany shortly after 1920. By 1928 the process had been adapted to the continuous commercial production of Carbonyl Iron Powder. Subsequently, detailed studies and meticulous laboratory-type controls in the plant permitted accurate regulation of purity and particle size for the needs of the modern electronic industry.

The first commercial Carbonyl Iron plant in the United States was opened at Grasselli, N. J., in 1941 by the General Aniline & Film Corporation, primarily to meet the large wartime demand for electronic equipment. Newer and finer grades of the powder were developed for use in high-frequency electronic equipment for radar and television. Later a second plant was put into operation at Huntsville, Alabama.

Thus the G A & F Carbonyl Iron Process is now well established and in steady operation. It is an outstanding case of the successful precision control of a sensitive chemical reaction to produce a unique material that must meet extraordinary specifications of purity, particle shape and size, and uniformity.

Write today for a free book—fully illustrated with performance charts and application data. It will help radio engineers or electronics manufacturers to step up quality, while saving real money. Kindly address your request to Dept. #24.

The Core is the Heart of the Circuit

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Magnetic Core Corporation
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MicroMatch models available for measuring RF power and VSWR from 500 KCS. to over 2000 MCS., and power levels from 10 milliwatts to 50,000 watts. For use as laboratory test equipment; peak power monitor for TV video transmitters; commercial FM stations; fixed and mobile police, aircraft, utilities etc. transmitters.

Write for complete descriptive literature on

The MicroMatch — RF Absorption Type Wattmeters
Dummy Load Resistors — Thermistor Bridges
Station Guardian for Transmitter Protection

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Included in the
DIRECTORY SECTION
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is a list of more than

800
DISTRIBUTORS OF ELECTRONIC COMPONENTS
and
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They are ready and
willing to serve you.

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ONE BOOK

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REGULATED D. C.
UP TO 1000 VOLTS AT 500 M. A.

Featuring continuously variable output voltage Without Switching

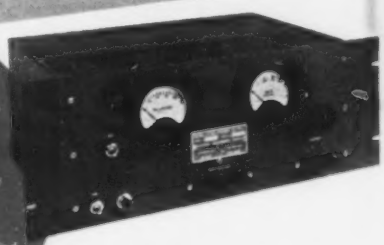
Here are four power supplies especially designed to cover a wide range of applications in development and production. These instruments feature continuously variable output voltage, good regulation, low hum level, good stability and overload protection. Models 200-B, 204-A 205-A and 207-B will operate from line input of 105 to 125 volts A.C. 50-60 cycles and provide rated regulation within this change. Examine the specifications carefully and you may find that one or more of these units has an application in your research or production program.

MODEL 204-A
0-500v D. C. at 300 MA.
Output Voltage:
0-500v D.C. at 300 Ma. regulated
6.3v A.C. at 6 Amps. unregulated
Regulation: Within 1% from 30-500 v
Hum: Within 10 millivolts at full load
Meters: 0-500v D.C.
0-300 Ma. D.C.
Negative or positive side of high voltage output may be grounded.

MODEL 207-B
200-1000v D. C. at 500 MA.
Output Voltage
200-1000v D.C. at 500 Ma. regulated
Regulation: Within 1% from 200-1000 Volts
Hum: Within 20 millivolts at full load
Meters: 0-1000v D.C.
0-500 Ma. D.C.
Negative side of high voltage grounded.

MODEL 205-A
100-325v D. C. at 150 MA.
Output Voltage:
100-325v D.C. at 150 Ma. regulated
0-150v D.C. at 5 Ma. regulated by VR tube
6.3v A.C. at 6 Amps. unregulated
Regulation: Within 1% from 100-325v D.C.
Hum: Within 10 millivolts at full load
Meters: None
Negative or positive side of high voltage output may be grounded.

MODEL 200-B
0-325v D. C. at 125 MA.
Output Voltage:
0-325v D.C. at 125 Ma. regulated
6.3v A.C. at 6 Amps. unregulated
Regulation: Within 1% from 20-325 v
Hum: Within 10 millivolts at full load
Meters: 0-500v D.C.
0-150 Ma. D.C.
Negative side of high voltage grounded.



Detailed information on any or all of the instruments above will be sent upon request. Price and delivery information will also be forwarded at the time of your request. Send for Catalog "A"—there is no obligation.

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Red Bank, New Jersey
REGULATED POWER SUPPLIES — VACUUM TUBE VOLTMETERS — SIGNAL GENERATORS

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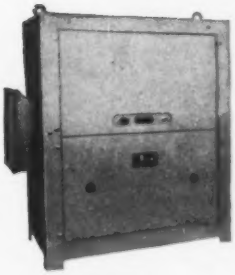
AC REGULATORS

GENERAL APPLICATION

Model NOS.	150S	250S	500S
Load-Range (VA)	0-150	0-250	0-500

MEDIUM CAPACITY

Model NOS.	1000S	2000S	3000S
Load-Range (VA)	0-1000	0-2000	0-3000

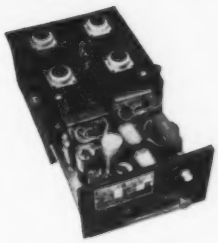


HEAVY DUTY UNITS

Model NOS.
5000S 10000S 15000S
Load-Range [VA]
0-5000 0-10000 0-15000

STANDARD AC SPECIFICATIONS

MODEL IN VA CAPACITY	150S 500S	250S 1000S	2,000S 3,000S	5,000S 10,000S 15,000S
Harmonic Distortion	3% max	2% max	3% max	3% max
Regulation Accuracy	±0.1% against line or load			
Input Voltage	95-130 VAC, also available for 190-260 VAC Single Phase 50-60 cycles			
Output Voltage	Adjustable between 110-130, 220-240 in 220 VAC models.			
Load Range	0 to full load			
P. F. Range	Down to 0.7 P. F. All models temperature compensated			
NOTE: REGULATORS CAN BE HERMETICALLY SEALED				



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400 CYCLE LINE

Model NOS. D 100, D 500, D 1200, D 2000
Load-Range (VA) 0-100, 0-500, 0-1200, 0-2000

Accuracy ± 0.5% against line and load. Maximum distortion 5%

Frequency Range 400 cycles ± 10%

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All types of three-phase systems effectively handled. Sorensen Engineers available to review your particular problems.

Load range 450 VA to 15 KVA

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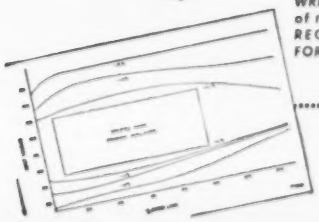
The SORENSEN NOBATRON (DC REGULATION) in effect eliminates the need for Batteries without losing any battery features. It maintains a constant voltage output against load variations, can be over compensated against line drop. It is a clean and self-sustaining source of DC power.

STANDARD DC SPECIFICATIONS

*Output Voltage	6	12	28	48	125
**Load in Amperes	5-15-40-100	5-15-50	5-10-30	15	5-10
Input Voltage	95-130 VAC single phase 50-60 cycles; adapter available for 220 VAC operation.				
Regulation Accuracy	0.2% from 0.1 to full load.				
Ripple Voltage RMS Maximum	1%.				
Recovery Time	0.2 seconds-value includes charging time of filter circuit for the most severe change in load or input conditions.				

*Adjustable + 10% –25%.
**Individual models identified by indicating output voltage first then amperes.
Example: E-6-5 = 6 VDC @ 5 amperes.

WRITE for FREE COPY of the "SORENSEN REGULATOR PERFORMANCE CHART"



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SPECIAL REQUIREMENTS can be met by employing the **ORIGINAL SORENSEN CIRCUIT**. Engineering Consultation available without cost.

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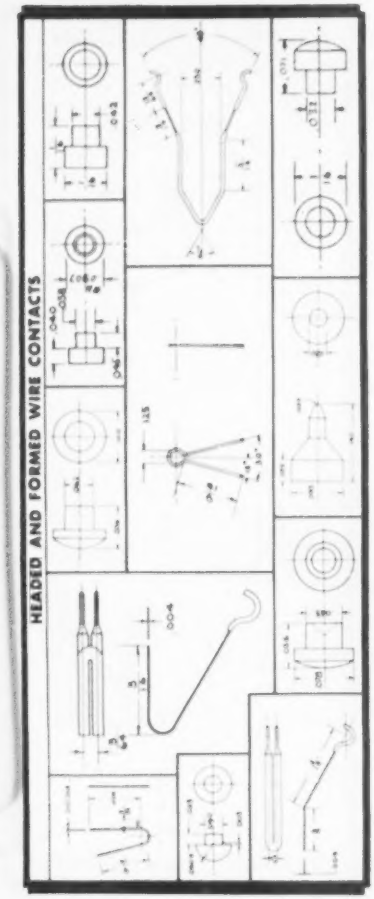

Standard NEY CONTACTS Simplify design problems

Chart shows form and overall dimensions of a few of the many types of contacts made from Ney Precious Metal Alloys for brush or wiping contact applications. Full technical and test data are available on request. Other Ney Precious Metal Alloys have solved many special industrial application problems. Consult us freely without obligation.

Write or telephone (HARTFORD 2-4271) *our Research Department*

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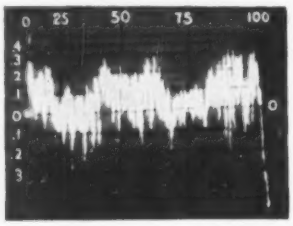
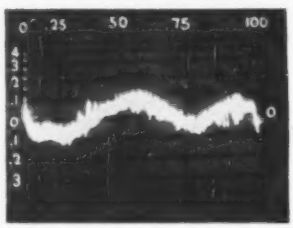
TEST RESULTS INDICATE LONGER LIFE AND GREATLY IMPROVED PERFORMANCE

Shown below are typical test results of PALINEY #7 . . . a typical Ney Precious Metal Alloy . . . being used for sliding contacts on nickel-chrome wire-wound potentiometers in comparison with phosphor bronze contacts. Figures show low initial error and maintained linearity typical of PALINEY #7 performance. Condition of both contacts and windings after test indicated substantially reduced wear.



Cathode Ray Oscillograph showing percentage error of standard potentiometer after one million cycles or two million sweeps of phosphor bronze contact over the wire. Initial linearity was ± .17% and the error increased to ± .28% plus noise.



Performance of standard potentiometer modified by substitution of PALINEY #7 contact after one million cycles or two million sweeps over wire. The initial error was reduced to ± .12% and this linearity was maintained throughout the test.

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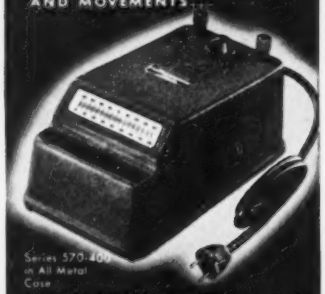

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A complete instrument, proved through years of rugged use in production testing, ideal for industrial and student laboratories. Its G-M mirror-type movement is both rugged and highly sensitive, uniformly accurate and easy to read. For 110-120 V, 50/60 cycle A.C. Available at your nearest supply house in choice of five sensitivities. Or write us for name of distributor.

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a plus feature

Immediately following the Product Listings in the

DIRECTORY SECTION

of this Issue

is a list of more than

2500

TRADE NAMES

of electronic and allied products.

They are intended for your use in determining the manufacturer's name when only a trade name is known.

FREED

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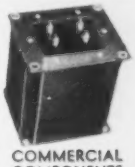
"PRODUCTS OF EXTENSIVE RESEARCH

NO. 1060 VACUUM TUBE VOLTMETER INPUT IMPEDANCE 50 MEGOHMS

NO. 1030 LOW FREQUENCY "Q" INDICATOR

HIGH FIDELITY TRANSFORMERS ½ DB 20 CPS TO 30 KC.

DISCRIMINATORS 10 CPS TO 1 MC



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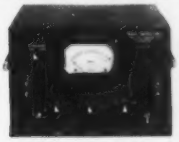


NO. 1140 NULL DETECTOR COMPLETE WITH SELECTIVE CIRCUITS

NO. 1020 MEGOHMMETER 2,000,000 MEGOHMS DIRECT READING

HERMETICALLY SEALED COMPONENTS TO MEET MIL-T-27 SPECS.

TOROIDAL INDUCTORS 60 CPS TO 1 MC

MINIATURE INDUCTORS 1000 CPS TO 100 KC

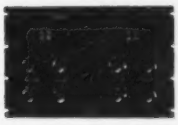
NO. 1210 NULL DETECTOR & VACUUM TUBE VOLTMETER

DECADE INDUCTORS 30 CPS TO 300 KC

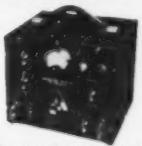
SUB MINIATURE HERMETICALLY SEALED TOROIDAL INDUCTORS

SUB MINIATURE HERMETICALLY SEALED COMMUNICATION COMPONENTS

SLUG TUNED COMPONENTS 1000 CPS TO 1 MC



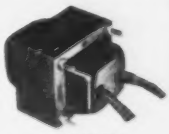
NO. 1150 UNIVERSAL BRIDGE 5 A.C. BRIDGES IN ONE UNIT



NO. 1010 COMPARISON BRIDGE FAST, ACCURATE, RELIABLE

STEPDOWN TRANSFORMERS 50 WATTS TO 3 KW.

PULSE TRANSFORMERS FROM WATTS TO MEGAWATTS



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1170 D.C. SUPPLY DIRECT CURRENT UP TO 500 MA.

NO. 1110 INCREMENTAL INDUCTANCE BRIDGE A NECESSITY FOR EVERY LAB.

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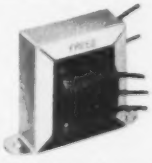

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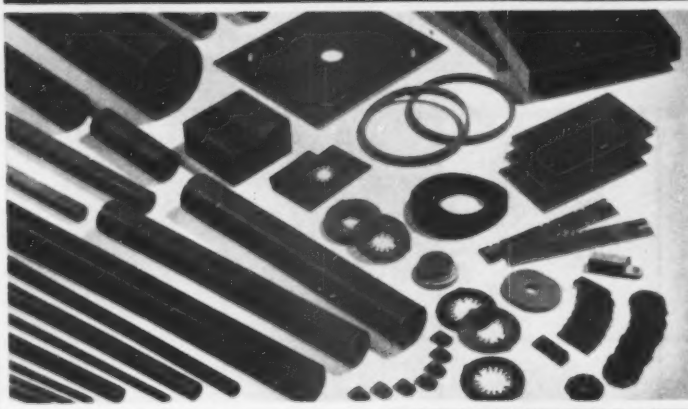
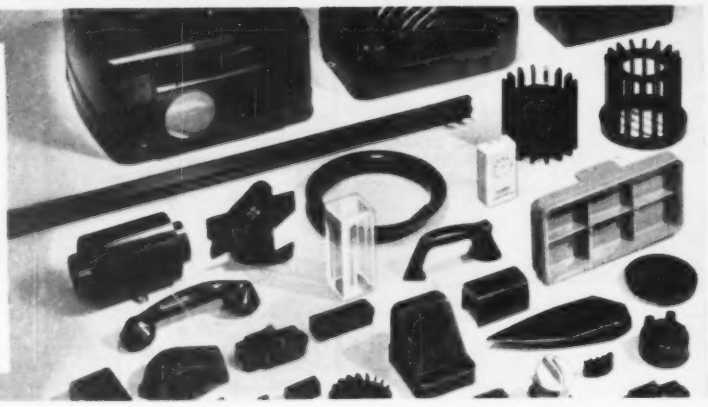


LAMINATED
INSUROK

Available in sheets, rods, tubes, and fabricated parts, in many grades, sizes, and thicknesses. Meets practically any requirement for uniformity, machinability, dielectric and physical strength.

MOLDED
INSUROK

Parts made to your specifications with various granular or chopped fabric base materials. Produced by compression, injection, or transfer process. Metal inserts can be molded into position.



RICHARDSON OFFERS YOU A Complete Range of TECHNICAL SERVICES

Richardson offers the extensive services of its research, design, and engineering staffs without cost or obligation. We provide custom molding, laminating, and fabrication facilities and techniques. This assures the correct selection of material and process for every application.

RESEARCH
For over one-quarter century, Richardson has pioneered in the development of new plastics and the improvement of old.

DESIGN
Experienced engineers analyze your requirements and help you select material, form, and process best suited to your needs.

PRODUCTION
Richardson has the plant equipment and know-how to handle even the largest, most difficult molded or laminated job.

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Complete facilities for punching or machining parts to your design and in any quantity.

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MILWAUKEE 3, WIS. (State Bank Bldg., 743 N. 4th St.)
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INSUROK Products Also Distributed By The Following:

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Founded 1858
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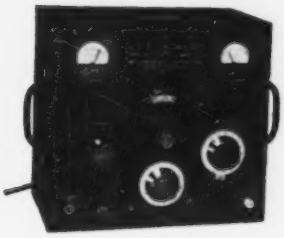
MEASUREMENTS CORPORATION

Laboratory Standards

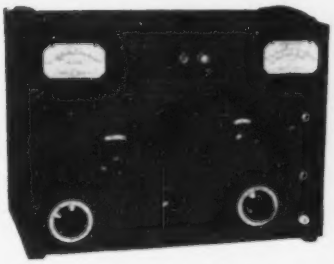
QUALITY ELECTRONIC
MEASURING INSTRUMENTS
FOR ACCURATE, DEPENDABLE SERVICE

NEW!

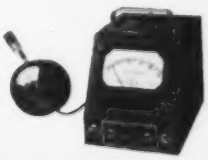
CRYSTAL
CALIBRATOR
Model 111
250 Kc. to 1000 Mc.



U. H. F. OSCILLATOR
Model 112
300 Mc. to 1000 Mc.



STANDARD SIGNAL GENERATOR
Model 82
20 Cycles to 50 Mc.



MEGACYCLE
METER
Model 59
2.2 Mc. to 400 Mc.

STANDARD SIGNAL GENERATORS

MODEL	FREQUENCY RANGE	OUTPUT RANGE	MODULATION
65-B	75 Kc.-30 Mc.	0.1 microvolt to 2.2 volts	AM. 0 to 100% 400 cycles or 1000 cycles External mod., 50-10,000 cycles
78	15-25 Mc.; 195-225 Mc. 15-25 Mc.; 90-125 Mc. other ranges on order	1 to 100,000 microvolts	AM. 8200-400 cycles 625-400 cycles Fixed at approximately 30%
78-FM	86 Mc.-108 Mc.	1 to 100,000 microvolts	Deviation 0-300 kc, 2 ranges FM. 400-8200 cycles External modulation to 15 Kc.
80	2 Mc.-400 Mc.	0.1 to 100,000 microvolts	AM. 0 to 30% 400 cycles or 1000 cycles External mod., 50-10,000 cycles.
82	20 cycles to 200 Kc. 80 Kc. to 50 Mc.	0-50 volts 0.1 microvolt to 1 volt	Continuously variable 0-50% from 20 cycles to 20 Kc.
84	300 Mc.-1000 Mc.	0.1 to 100,000 microvolts	AM. 0 to 30%, 400, 1000, or 2500 cycles. Internal pulse modulator. External mod., 50-30,000 cycles.
90	20 Mc.-250 Mc.	0.3 microvolt to 0.1 volt	Continuously variable, 0 to 100% Sinusoidal modulation 30 cycles-5 Mc. Composite TV modulation.

U.H.F. OSCILLATOR

MODEL	FREQUENCY RANGE	OUTPUT RANGE	OUTPUT IMPEDANCE
112	300 Mc. – 1000 Mc.	Maximum varies between 0.3 volt and 2 volts. Adjustable over 40 db range	50 ohms

PULSE GENERATOR

MODEL	FREQUENCY RANGE	PULSE WIDTH	OUTPUT
79-B	60 to 100,000 cycles	Continuously variable from 0.5 to 40 microseconds	Approximately 150 volts positive with respect to ground. "Sync Output" 75 volts positive with respect to ground.

SQUARE WAVE GENERATOR

MODEL	FREQUENCY RANGE	WAVE SHAPE	OUTPUT
71	Continuously variable 6 to 100,000 cycles	Rise time less than 0.2 microseconds with negligible overshoot	Step attenuator: 75, 30, 25, 13, 10, 5 peak volts fixed and 0 to 2.5 volts continuously variable.

U.H.F. RADIO NOISE and FIELD STRENGTH METER

MODEL	FREQUENCY RANGE	INPUT VOLTAGE RANGE
58	15 Mc. to 150 Mc.	1 to 100,000 microvolts in antenna. 1 to 100 microvolts on semi-logarithmic output meter, balanced resistance attenuator with ratios of 10, 100 and 1000 ahead of all tubes.

VACUUM TUBE VOLTMETERS

MODEL	VOLTAGE RANGE	FREQUENCY RANGE	INPUT IMPEDANCE
62	0-1, 0-3, 0-30 and 0-100 volts AC or DC	30 cycles to over 150 Mc.	Approximately 7 mmfd.
62-U.H.F.	0-1, 0-3, 0-30 and 0-100 volts AC or DC	100 Kc. to 500 Mc.	Approximately 2 mmfd.
67	.0005 to 300 volts peak-to-peak	5 to 100,000 sine-wave cycles per second	1 megohm shunted by 30 mmfd.

MEGACYCLE METER

MODEL	FREQUENCY RANGE	FREQUENCY ACCURACY	MODULATION
59	2.2 Mc. – 400 Mc.	Within ±2%	CW or 120 cycles fixed at approximately 30%. Provision for external modulation

CRYSTAL CALIBRATOR

MODEL	FREQUENCY RANGE	FREQUENCY ACCURACY	HARMONIC RANGE
111	250 Kc. – 1000 Mc.	0.001%	.25 Mc. Oscillator: 25-450 Mc. 1 Mc. Oscillator: 1-600 Mc. 10 Mc. Oscillator: 10-1000 Mc.

BRIDGES

MODEL	INDUCTANCE (L)	CAPACITANCE (C)	AC RESISTANCE (R)
102	0.5 microhenry to 110 henries	1 mmf. to 110 mfd. Power factor 0-30%	1 ohm to 11 megohms

MEASUREMENTS CORPORATION • BOONTON, N. J.

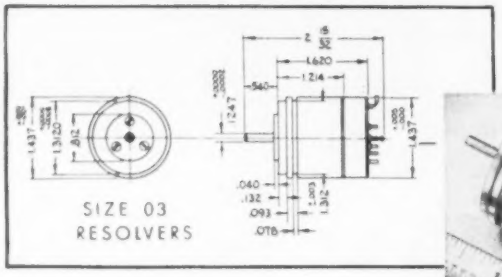
NEW MINIATURE ELECTRICAL RESOLVERS

FOR COMPUTER PROBLEMS OF INDUSTRY

ARMA SIZE 03 (8 types)

KEY COMPONENTS IN ARMA'S POST-WAR TECHNIQUE OF ELECTRICAL "BRAIN BLOCK" INSTRUMENTATION

"Brain Block" instrumentation quickly describes any custom arrangement of light, small, accurate standard Arma components to make precision instruments and controls.



TYPICAL SPECIFICATIONS

SIZE	TYPE	DRAWING NUMBER	FREQ.	INPUTS	OUTPUTS	TRANSFORMATION RATIO (S-P)	PHASE SHIFT	INERTIA (oz-in²)	MAX STATIC TORQUE (oz-in)	WEIGHT (lbs.)	MAX ANGULAR ERROR	MAX AXIS MISALIGNMENT	REQUIRED TO ATTAIN TABULATED ACCURACIES			
													INPUT VOLTAGE	TEMPERATURE	AMPLIFIER DWG. NO.	AMPLIFIER WEIGHT (lbs.)
03	03A400	78632	400 ± 0.5	2	2	1.000 ± .0025	0° 0' ± 15'	0.05	0.5	35	0.12% E_s*	± 7.0'	0.5 to 16.0	15° to 70° C	78640	1.7
03	03A400	78633	400 ± 0.5	2	1	1.000 ± .0025	0° 0' ± 15'	0.05	0.5	35	0.12% E_s*	± 7.0'	0.5 to 16.0	15° to 70° C	78640	1.7
03	03L400	78634	400 ± 0.5	1	2	1.000 ± .0025	0° 0' ± 15'	0.05	0.5	35	0.12% E*	± 7.0'	0.5 to 16.0	15° to 70° C	78640	1.7 (Note #1)
03	03M400	78635	400 ± 0.5	1	1	1.000 ± .0025	0° 0' ± 15'	0.05	0.5	35	0.12% E*	± 7.0'	0.5 to 16.0	15° to 70° C	78640	1.7 (Note #1)
03	03A026	78636	400 ± 0.5	2	2	955 ± .015	4° 30' ± 30'	0.05	0.5	35	0.12% E_s*	± 7.0'	0.5 to 16.0	25° C	Not Required	
03	03A400	78637	400 ± 0.5	2	1	955 ± .015	4° 30' ± 30'	0.05	0.5	35	0.12% E_s*	± 7.0'	0.5 to 16.0	25° C	Not Required	
03	03Q026	78638	400 ± 0.5	1	2	955 ± .015	4° 30' ± 30'	0.05	0.5	35	0.12% E*	± 7.0'	0.5 to 16.0	25° C	Not Required	
03	03M400	78639	400 ± 0.5	1	1	955 ± .015	4° 30' ± 30'	0.05	0.5	35	0.12% E*	± 7.0'	0.5 to 16.0	25° C	Not Required	

Deviations shown are maximum — Average deviation is much less. Quadratures and harmonics each never exceed 0.1% of the sum of the input voltages. Characteristics shown are attainable with indicated required auxiliary equipment and good engineering practices for precision circuits. Note #1. One amplifier may be used with two resolvers of this type

*E = Input
†E_s = Sum of Inputs

These are the resolvers about which management men have been reading: "One of the means by which the many fast changing variables of industry can be co-ordinated and electrically translated is Arma's electrical resolver . . . the "brain block" that replaced a formidable aggregation of gears and slides previously used to solve the trigonometric functions. It is used in instrumentation involving computers and action-triggering circuits. And, resolvers come off Arma production lines accurate to a degree seldom equalled outside the precision model shop. They fit interchangeably into instrument assemblies."

RESOLVER CATALOG JUST PRINTED GIVES COMPLETE DETAILS ASK FOR A COPY

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ARMA ELECTRICAL RESOLVERS* ARMA SYNCHROS ARMA INDUCTION MOTORS ARMA INDUCTION GENERATORS ARMA MECHANICAL DIFFERENTIALS ARMA ALTERNATING VOLTAGE COMPARATOR COMPUTING MECHANISMS INDUSTRIAL CONTROLS STABILIZATION DEVICES NAVIGATIONAL EQUIPMENT LIMITRON AUTOMATIC INSPECTION SYSTEM

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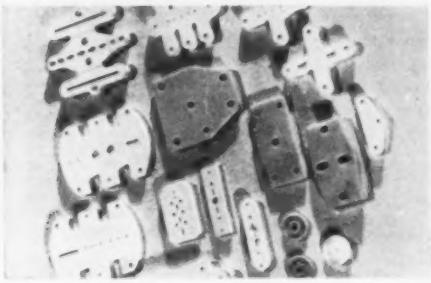
QUALITY ARMA INSTRUMENT PRECISION

Stupakoff

CERAMICS KOVAR-GLASS TERMINALS KOVAR METAL

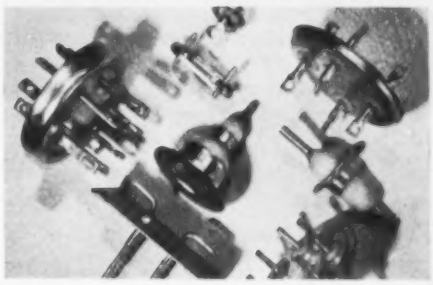
Products

CERAMIC PRODUCTS



Cathode ray tube mount support Tubes and Spacers
Low-loss Strains and Spreaders
Coaxial Cable Insulators
Precision ground ceramics, Plates, Shafts—plain or metallized
Shafts and End Plates, plain or metallized, for Condensers
HiK Compositions, P-100 through N-1400; K-33 to K-4000, as rods, tubes, discs, special shapes, plain or metallized
Resistor Cores and Cases—plain or metallized
Temperature-sensitive Ceramic Resistors
Round, square and conical Stand-offs and Stand-off Assemblies
Coil Forms—cylindrical and bar-type
Insulcon—a rich source of infra-red radiation
Investment Casting Cores—precision-made, threaded and special shapes
Sockets, Switch Bases, Outlet Boxes and Entrance Bushings
Tubing—Single—or multiple-hole
Flex-Sok Beads—insulators for wire
Ceramic Dash Pots and Pointer Stops
Arc and flame-resistant ceramics
Stupalith Ceramic—highly resistant to thermal shock
Grommets, Elements, Cores, Spools and Hooks
Thermocouple Insulators
Stupacitor Trimmers and Stand-offs
Combination Capacitors and Stand-offs
Tubular Ceramic Trimmer Capacitors
Cathode Insulators and Spacers for Electron Tubes
Transposition and Dissipation Line Insulators
Mercury Switch Ceramic Parts
Immersion Heater Ceramics

KOVAR-GLASS SEALS



Stupakoff Kovar-Glass Seals cover the field of high-quality, vacuum-tight seals.

Single terminal, lead through, from sub-miniature up to $\frac{3}{8}$-inch flange diameter.

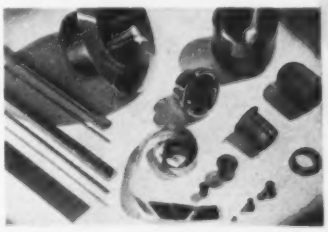
Multi-terminal Headers.
Four to eight terminals, $1\frac{1}{8}$ to $1\frac{3}{4}$ inch diameter
Four to thirteen terminals, 0.900 to $1\frac{1}{4}$ inch diameter
Eight terminals, $1\frac{1}{4}$ inch diameter

Crystal Holder Assemblies—all standard sizes.

Kovar, glass, ceramic seals—sub-miniature to $1\frac{1}{4}$" flange diameter.

Special designs to customers' specifications.

KOVAR* METAL



Kovar, an Alloy designed for sealing to hard glass, is available in the form of Rod, Wire, Sheet, Foil or in fabricated shapes, such as Cups, Eyelets or other forms. For use by manufacturers of electron tubes or others who are engaged in glass-working operations.

When requesting literature on Kovar, please state the general nature of your application.

* Westinghouse Trade Mark No. 337962

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magnetic iron powders

IRN magnetic iron powders (Mepham hydrogen reduced) are available in 10 different types for high-frequency cores, core material, tele-communication and magnetic applications. . . . All are described in a revised technical bulletin, containing 28 pages of comprehensive data, including performance graphs and engineering reference material of value to designers, manufacturers and users. Your copy of this bulletin will be mailed on request.

MEPHAM
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Metallurgical and Electronic Division

IRN **C. K. WILLIAMS & CO.**
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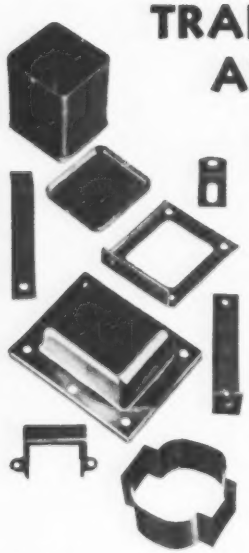
STANDARD TRANSFORMER CASES AND COMPONENTS



Olympic manufactures a complete range of standard transformer cases and components, available from stock in sizes specifically designed for standard size cores.

Cases can be furnished with pierced holes if required, or with a special Olympic snap lock feature which speeds assembly and production.

Transformer cases and covers in standard sizes or to meet your specifications—core bands — mounted covers — deep drawn flanged covers—mounting brackets—channels—reinforcing feet—covers with pierced, rolled or amphenol holes—special chassis and sheet metal fabrications. Complete transformer case kit assemblies are also available. Write for complete information.

Write today for standard specifications —or send us your problems!

OLYMPIC
Metal Products Company, Inc.
P. O. Box 71, Phillipsburg, N. J.

Titeflex

FLEXIBLE WAVEGUIDES
Save Money
IN VIDEO TRANSMISSION

Titeflex Waveflex Waveguides used in television transmission. Assembled lengths of Waveflex over 30 feet long connect movable antenna with transmitter inside building. Antenna is directed at Empire State Bldg., faintly visible in background.

Titeflex Waveflex Waveguides give you all the advantages of rigid waveguides *plus* the additional feature of flexibility. Complicated bends and twists can be made with virtually no change in electrical properties . . . installation costs are lowered . . . design problems are simplified. Waveflex Waveguides are made in many standard types to Army-Navy specifications—or our engineers will develop special styles for you.

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COMPLETE WAVEFLEX CATALOG

TITEFLEX, INC.
500 Frelinghuysen Ave., Newark 5, N. J.

Hold on to this book

It will be June 1951 before another edition is published

IT IS THE MOST COMPLETE, AUTHORITATIVE AND UP-TO-DATE DIRECTORY OF ELECTRONIC AND ALLIED PRODUCTS AVAILABLE.

It gives you the manufacturers of each of more than fourteen hundred electronic and allied products.

. . . gives you information as to where they are in production or available in a reasonable time and unrestricted for general industrial use.

1950-1951

electronics BUYERS' GUIDE

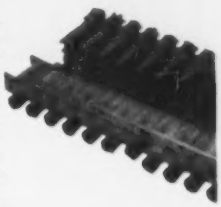
Please mention this book when buying or inquiring from it

SWITCHES
by GENERAL CONTROL

• LEVER • FOOT • PUSH-BUTTON

PUSH-BUTTON SWITCH MODEL MPB

A complete heavy-duty push-button switch with high current-handling ability. Furnished in from two to a maximum of twelve positions. Standard frame types are: (1) locking, (2) non-locking, (3) release-lock, and (4) accumulative locking with single-button release; flexibility of design allows choice of special forms. Besides standard mounting illustrated, MPB switches can be furnished on right-angle frame for use where back of panel space is limited. Std. mtg. 4-7/16" deep; rt. angle mtg. 1-9/16" plus ht. of contact assembly. Pure silver contacts, phosphor bronze springs. Rating: 5 amps., 125 volts a-c (non-ind.). Write for data sheet PS.



FRAME TYPES	MPB-1	MPB-2	MPB-3	MPB-4	MPB-5	MPB-6	MPB-7	MPB-8	MPB-9	MPB-10	MPB-11	MPB-12
CONTACT POSITIONS	2	3	4	5	6	7	8	9	10	11	12	
Lock Button	$5.80	$5.20	$6.40	$7.00	$8.00	$10.00	$11.20	$12.40	$13.00	$14.40	$15.60	
No-Turn Lock Button	5.90	7.00	7.40	8.40	10.30	11.75	13.20	14.65	16.10	17.55	19.00	
Accumulative Lock	No data	6.30	8.65	10.90	13.55	14.90	16.45	18.40	20.35	22.30	24.85	

CONTACT FORMS	A	B	C	D	X	F	G	H	Mk
Circuit									
Price	$4.75	$4.75	$4.95	$4.95	$4.75	$4.95	$4.95	$4.95	

• Reset button requires one position in addition to standard contact positions. Reset button is on right-hand side unless otherwise specified.

• Reset button normally actuates no contacts but *can* be used to actuate *momentary* contacts if required.

CAM-LEVER SWITCHES

Compact lightweight switches designed for long life and trouble-free service fitting many requirements. Features include shielding between contact sections, single-hole and standard mounting centers, plus availability of popular and special build-up variations. Immediate shipment of standard types. Special quotations given promptly. Write for Data Sheet LS.

MCT-1

MCT-4

TYPE	AMPS.*	HIGH	WIDE	LONG**
MCT-1	1	1-1/4"	1/2"	2-5/16"
MCT-4	1	1-1/2"	3/4"	2-1/2"
MCM	5	1-1/4"	1-1/4"	2-25/32"
MCL	10	1-3/4"	1-3/8"	3-15/16"

* 125 volts, 60 cycles, non-inductive
** From back panel to end of terminals

FRAME TYPES	CONTACT FORMS	A	B	C	D	E	F	G	H	Mk
	CIRCUIT									
MCT	$3.50	MCT	36	36	36	36	36	36	36	36
MCM	$2.75	MCM	55	55	65	65	1.10	65	65	65
MCL	$3.00	MCL	85	85	95	1.20	1.90	95	95	95

MCM

MCL

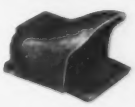
FOOTROL®
GENERAL CONTROL

KEEPS HANDS WORKING

TYPE MX

TYPE MC

TYPE MI



TYPE MB

*Foot switches to meet every need. Sturdy cast-iron cases with durable finish. Standard rating 20 amp. 125 v.a-c. non-inductive. For heavy duty rating — 20 amp. 125/250/460 v.a-c; ¾ HP, 115 v.a-c. 1½ HP 230 v.a-c — add $1.00 to price shown. Sizes: MX — 4½ x 2 x 4"; MC — 4" dia. x 2⅛"h; MI — 6¾ x 5 x 4"; MB — 8 x 5 x 5¼". Write for Data Sheet FS.

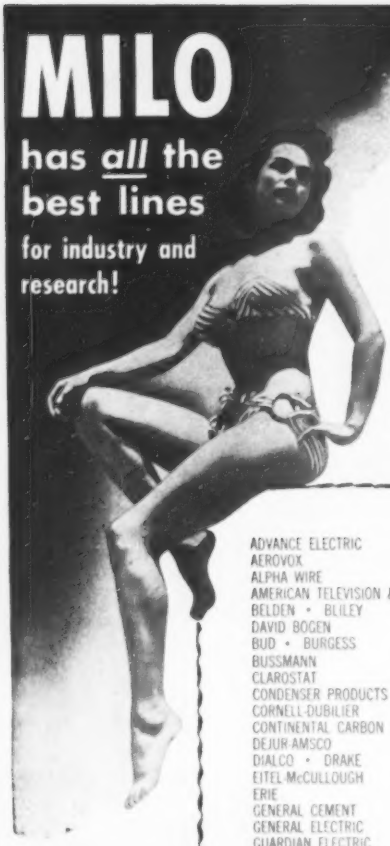
TYPES				CONTACT TYPES	CONTACT OPERATION
MX-1 $3.30	MC-11 $5.50	MI-21 $8.80	MB-31 $12.50	A	Normally open Spring return
MX-2 $3.30	MC-12 $5.50	MI-22 $8.80	MB-32 $12.50	B	Spring return Normally closed
MX-3 $3.30	MC-13 $6.00	MI-23 $9.35	MB-33 $13.00	C	Double throw Spring return
—	MC-14 $8.25	MI-24 $11.55	MB-34 $15.00	ACO-A	First press closes switch Second press opens switch
—	MC-15 $8.75	MI-25 $11.85	MB-35 $15.50	ACO-C	First press transfers switch Second press restores switch
—	—	MI-26 $13.00	MB-36 $16.50	TS-AA	1st half-throw closes 1st switch 2nd half-throw closes 2nd switch Spring return

*T.M. Reg. App'd for.

GENERAL CONTROL COMPANY
1202 SOLDIERS FIELD ROAD
BOSTON 34, MASSACHUSETTS

MILO

has *all* the best lines for industry and research!



These leading brand-name companies are just a partial list of the more than 150 first-rate manufacturers whose products are *available now* from Milo's great warehouse of complete stocks:

ADVANCE ELECTRIC
AEROVOX
ALPHA WIRE
AMERICAN TELEVISION & RADIO
BELDEN • BLILEY
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BUD • BURGESS
BUSSMANN
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Radio & Electronics Corp.
200 Greenwich Street, New York 7, N. Y.
Cable Address: MILOLECTRO
The ONE source for ALL your electronic needs

Regulated Power Supply
NO. 245

OUTPUT VOLTAGE DC: 200–500 volts.

OUTPUT CURRENT DC: 0–200 milliamperes.

REGULATION: Less than ½% for both line fluctuation from 105 to 125 volts and load variation from minimum to maximum current.

RIPPLE VOLTAGE: Less than 5 millivolts.

OUTPUT IMPEDANCE: Less than 2 ohms.

OUTPUT AC: 6.3 volts 6 amperes unregulated.

Multiple Power Supply
NO. 103

TWO B SUPPLIES: 0–300 volts. Current 75 milliamperes each, 150 milliamperes when paralleled. Ripple less than 10 millivolts.

ONE C SUPPLY: Minus 50 volts to plus 50 volts. Current 5 milliamperes. Ripple less than 5 millivolts.

ONE HEATER SUPPLY: 6.3 volts AC. Current 5 amperes.

•

Write for Specifications on Complete Line of Power Supplies

Kepco Laboratories, Incorporated
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➡ No other UHF manufacturer offers a more varied or diversified development and design engineering staff for integrated electronic systems. . .

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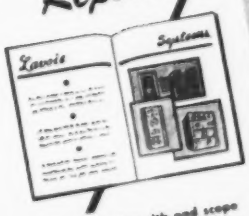

shows the breadth and scope of LAVOIE LABORATORIES' facilities. Address us on your letterhead — we shall be glad to send you a copy or consult with you at your convenience.

U V H F

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RADIO ENGINEERS AND MANUFACTURERS

MORGANVILLE, N. J.

Specialists in the Development and Manufacture of UHF Equipment

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BRADLEY SELENIUM RECTIFIERS

Our Vacuum Process is unique and exclusive. It has set new standards of quality control in the manufacture of selenium rectifiers. It insures low cost rectifiers with uniformity of rating.

Leading manufacturers of electronic equipment and instruments have found that Bradley rectifiers help them achieve desired product performance. We make selenium rectifiers for operation from a few microamperes to many thousands of volts.

For accurate and predictable power conversion, specify Bradley. Our engineers are always available for assistance. They can help you get the right rectifier for your application.

HIGH CURRENT USES

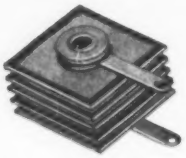
SE11X Series

These large power stacks are constructed to provide high efficiency and stability. Plate sizes up to 5" x 6". Rated up to thousands of amperes.

HIGH VOLTAGE USES

SE8 Series

These rectifiers are designed to provide maximum rating and efficiency with minimum size. Smallest completely sealed rectifier of its type. Rated from a few microamperes up to 12.5 ma D.C. and up to 6000 volts peak inverse. Units can be connected in series to obtain very high voltages.



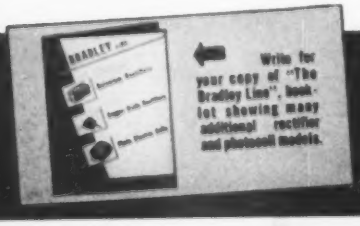
RS Series

BRADLEY RS MINIATURE RECTIFIERS replace most rectifier tubes in radio, television, amplifier and other DC power requirements. Rated 130 Max. RMS volts input, 380 volts peak inverse Max. from 65 ma DC to 250 ma DC.

BRADLEY COPPER OXIDE INSTRUMENT RECTIFIERS have vacuum-processed gold contacts for maximum efficiency and minimum temperature error. Precision made to meet the most rigid matching and balancing requirements, yet low in cost. Universal type rectifier shown for all replacements or AC meter conversions. Rated up to 12 volts AC, 5 ma DC.

PHOTOELECTRIC CELLS

Bradley Luxtron ® photocells convert light directly into electrical energy without external power source for direct operation of meters and meter relays. They are versatile, rugged, true to rating, simple to install. Wide range of models, sizes and shapes.



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COSMALITE* AND CLEVELITE* LAMINATED PHENOLIC TUBES

possess outstanding advantages for quality performance at low cost. They are accepted as the standard in the Radio and Television Industries. Available in diameters, wall thicknesses, and lengths desired.

COSMALITE and CLEVELITE are made to meet the most exacting specifications as to their physical and electrical properties for special electrical equipment such as

Coil forms . . . Insulating sleeves . . . Coil winding bobbins . . . Laminated insulation parts . . . Tubing of various types such as fibre, paper, plastic, synthetic resin, varnished or lacquered.

For the best . . . "Call Cleveland." Samples on request.

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CINCH MANUFACTURING CORPORATION

1026 S. HOMAN AVE. • CHICAGO 24, ILLINOIS

CINCH SOCKETS: The large variety of Cinch Sockets include many for Radio, Television, vehicular, and air-borne use. Shown are a few of the most popular standard sockets from the complete line. The component parts are of the best materials available. Precision engineering and careful inspection guarantee these sockets to be dependable and durable under the most exacting requirements.

The various types of sockets include: Molded Octal with 1 5/16" and 1½" mounting centers; Chassis Cinch Octal; Ring Mounted Octal; Molded Loktal; Glass Tube Sockets and Wafer Octal. Molding material includes high dielectric black bakelite or mica-filled low loss bakelite. Contacts are of solder coated brass. Mounting holes from 1" up to 1½". Glass Tube Sockets will fit 4 to 7 prong tubes.

CINCH CAPACITOR "PLUG-IN" SOCKETS Small models for use with Mallory and Magnavox 1" FP type condensers. Large model 1⅜". Three or four recessed center contacts. Ideal for instant replacement in telephone, airborne radio, broadcasting equipment, etc. when electronic circuits fail.

CRYSTAL SOCKETS In two prong and four prong types. Two prong for 31/64" and ½" centers. Four prong 31/64" centers. Molded from either bakelite or mica-filled bakelite. For use with FT243 type crystals and SR-1 and SR-7 type crystals.

7 and 9 PIN MINIATURE SOCKETS & SHIELDS

Cinch manufactures 7 pin miniature sockets and shields being used extensively for radio, television, FM, vehicular equipment, etc. They also—in cooperation with tube manufacturers—have designed and produced a complete line of molded and laminated miniature sockets for the Noval 9 prong tube. Used extensively for radio, television, radio controlled taxis, and other vehicular communication equipment. Types include the following: Molded-Saddle, for top or bottom mounting; Wafer and Chassis Cinch. Tube shields include Shield Base and Snap-On type. Molding material is either high dielectric bakelite or mica-filled low loss bakelite. Silver coated brass contacts, 7 pin types, have ⅞" mounting centers (Wafer types 1" and 1 5/16" mounting centers). 9 pin have 1⅛" mounting centers. Shields are made from durable steel and are available in three lengths.

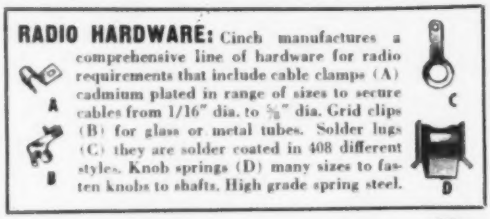
CINCH-ERIE "PLEXICON" TUBE SOCKETS

with built-in ceramic condensers. Effective methods of by-passing tube pins with condensers close to tube element, plus shortest path to ground. Cap. up to 1000 MMF. Any tube element may be coupled or by-passed as desired. Molded from mica-filled low loss bakelite. Specially designed silver plated beryllium copper contacts. Types include: Octal, Loktal 1-5/16" mtg. centers. 7 pin miniature ⅞" mtg. centers. 9 pin miniature 1⅛" mounting centers.

SEND FOR COMPLETE CATALOGUE

The Cinch catalogue No. 49 contains complete data and prices on all of the Cinch electronic components. Requests on company letterhead will be promptly answered.

RADIO HARDWARE: Cinch manufactures a comprehensive line of hardware for radio requirements that include cable clamps (A) cadmium plated in range of sizes to secure cables from 1/16" dia. to ⅝" dia. Grid clips (B) for glass or metal tubes. Solder lugs (C) they are solder coated in 408 different styles. Knob springs (D) many sizes to fasten knobs to shafts. High grade spring steel.



BATTERY PLUGS: Fit all types of batteries. Nickel plated brass tube pins on high grade bakelite. Send for chart that indicates correct plug for all popular batteries.

CONNECTOR PLUGS & SOCKETS

Low cost plugs and sockets ideal for a multitude of applications. Particularly where space is at a premium. Plugs for 2 to 35 prongs. Sockets for 2 to 35 contacts. Polarized nickel plated brass tube pins. Solder coated brass contacts. Lock feature prevents turning in shell.

PLUG CAPS & SHELLS for the above connector plugs and sockets and battery plugs. Cadmium plated brass shell or black nickel finish. One type 18J has fibre insulator with ½" neck.

PIN PLUGS Includes pin plugs for record players, auto radios, receivers, etc.; Automotive Plugs, 8 cutting edges provide positive ground connection in Cinch No. 81 connectors; Insulated Pin Plug.

JACKS Single or double phono for recording units, receivers, auto sets, etc. Also Phono Tip Jacks, double or triple for speakers, headphones, etc.

CONNECTORS Automotive connectors, shell or flange type. Motorola type shielded jack. Solder coated shell, flange and contact. Screw or rivet mounted. Used extensively on auto radios.

STAND OFF TERMINALS Insulated for TV and other high voltage applications. Excellent for passing high voltage wires through chassis. Two lengths, 9/32" and 13/32". Mica-filled low loss bakelite.

Lug & Screw Type Terminal Strips

Screw type ideal for chassis or breadboard layouts. 1 to 6 lugs (1/16" bakelite); 7 to 10 terminals (3/32" bakelite). Strips handy for supporting resistors, condensers, etc. in circuit wiring. Strips 1/16" thick and ⅜" wide. Lugs spaced ⅜" on centers. Terminals and lugs are solder coated brass.

110-250 V. SOCKET

For use in limited space. Rated 15 amp. 110v or 10 amp. 250v. High dielectric bakelite, silver coated brass contacts on ½" centers. For any two prong standard electric plug.

HEARING AID SOCKETS

Sub-miniature for hearing aids, radio controlled model airplanes or other applications, using sub-miniature tubes. Mica-filled low loss bakelite, silver plated beryllium copper contacts. 5, 6, or 7 contacts. For conventional wiring and printed circuit applications.

HOWARD B. JONES DIVISION

CINCH MANUFACTURING CORPORATION

1026 S. HOMAN AVE. • CHICAGO 24, ILLINOIS

JONES PLUGS & SOCKETS

300 Series

S-306-AB

P-306-CCT

For use in circuits not exceeding 45v at 5 amps. Small size but good separation between contacts. 2 to 33 contacts. Body of molded bakelite, phosphor bronze "knife-switch" type socket contacts. Prongs 5/32" x 3/64". Formed metal caps finished in black crystal. Fibre linings for caps are also formed. No. S-306-AB (illustrated) 6 contacts. Socket with angle brackets. No. P-306-CCT (illustrated) 6 contacts; a plug, cable clamp in cap. All plugs and sockets polarized—one size plug will not fit socket of another size. Many other types available.

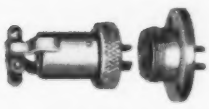
2400 Series

S-2406-SB

P-2406-CCT

Designed for highest electrical, mechanical efficiency (110v at 10 amps). Socket contacts of phosphor bronze, cadmium plated. Available in 2, 4, 6, 8, 10, 12 contacts. All plugs and sockets polarized. Choice of molded bakelite. Contacts mounted in recessed pockets greatly increasing leakage distance and increasing voltage rating. Improved socket contacts—four individual flexing surfaces. Positive contact over practically their entire length.

202 Series



Made in two contacts only. Metal parts are brass with burnished cadmium plate. Molded bakelite insulation. Phosphor bronze "knife-switch" type socket contacts engage both sides of flat plug contacts—double contact area. Formed fibre linings in caps. Polarized. Knurled nut has $\frac{3}{4}$"—27 thread.

SPECIAL TERMINAL PANELS manufactured by the Howard B. Jones Division, solve the problem encountered in individual pieces of equipment. Insulation is bakelite. Any number of Terminals can be mounted. Metals include brass, copper; tin or cadmium plated. There is a Jones terminal strip to meet your every need. Send us a print or a description of your requirements and we will promptly submit prices.

MULTIPLE FUSE MOUNT PANELS No. 1200 Series

Convenient panel arrangement for multiple circuits. One side is common making it convenient for wiring. Screw terminals on same side of panel as fuse clips. Mounts No. 3-AG fuses. 1 to 6 fuse mtg. or $2\frac{1}{2}$" to 3" centers.

BARRIER TYPE TERMINAL STRIPS

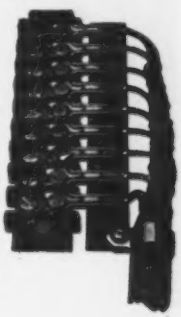
2-141-Y

2-141-¾W

2-141

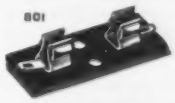
Provide increased insulation by having Barriers placed between each terminal. They follow around edge of strips and terminate at base. They not only make long leakage path but prevent direct shorts from frayed wire at the terminals. Mounting holes are at the ends. Base is of molded bakelite. Terminals and Binder Screws are brass, nickel plated. Marker strips may be ordered and imprinted to supply terminal designations. They mount beneath terminal strips and also afford insulation from metal mounting surface. Send for imprinting data. No. 141 series is illustrated.

JONES FANNING STRIPS



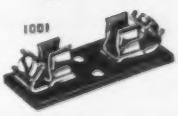
For connecting to barrier terminal strips. They eliminate color coding, speed up assembly, improve appearance, insure correct connections. Made of .032" brass, cadmium plated and are furnished with either a hole in right or left end for fastening the cable. Makes replacement of units an easy matter and assures correct connections after servicing. Cable clamps are available for fanning strips and are furnished in six different sizes. In small space areas right angle mounting permits use when Barrier mounts flush with side of chassis. Illustration shows No. 9-141 Barrier Strip and 9-161 Fanning Strip.

FUSE MOUNTS



800

900



1000

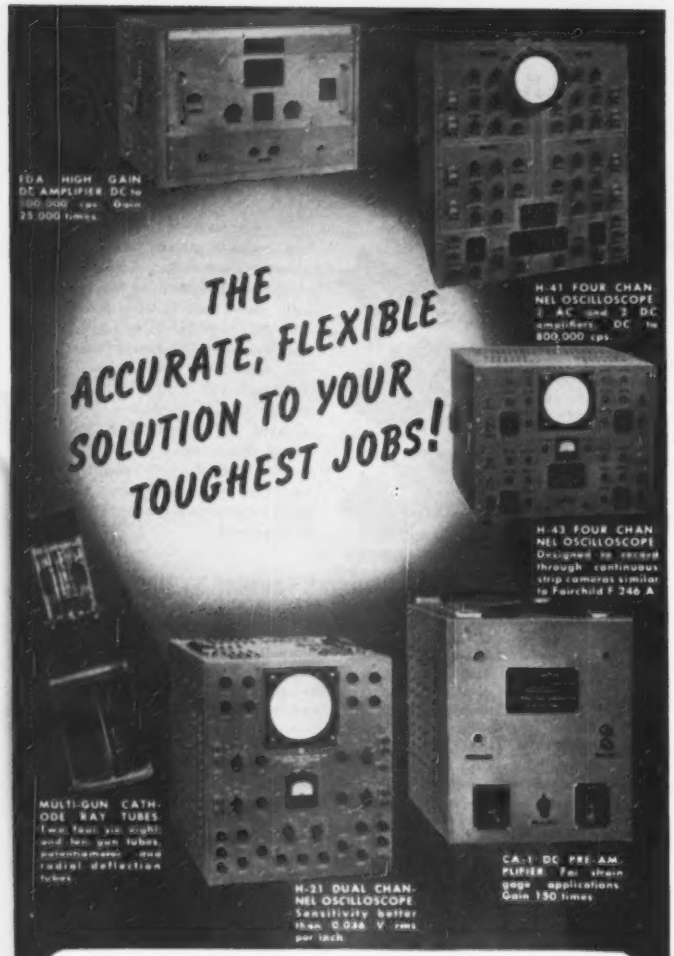
800 Series: Provides solder tab on the same side of the panel as the fuse clips. Mounts No. 3-AG fuses. Panels with clips for spare fuse having word "SPARE" imprinted on panel. Number of fuses 1—7 mounting on centers $\frac{3}{8}$"—3".

900 Series: Provide solder tab on the opposite side of panel to the fuse clips. Mounts No. 3-AG fuses. Has same "SPARE" marking and number fuses and mounting center holes as No. 800.

1000 Series: Provide screw terminals on the same side of the panel as fuse clips. Clips are mounted so that screws face end of panel. Has same "SPARE" imprint, number of fuses and mounting hole centers as previous types.

SEND FOR JONES CATALOG . . .

The above items indicate only a small portion of the complete Howard B. Jones line. Send for their catalog No. 18 which will give you complete data (prices, electrical characteristics, etc.). Your request for this catalog or for quotes on special products will be promptly answered.


FDA HIGH GAIN DC AMPLIFIER DC to 100,000 cps Gain 25,000 times
H-41 FOUR CHANNEL OSCILLOSCOPE 2 AC and 2 DC amplifiers DC to 800,000 cps
H-43 FOUR CHANNEL OSCILLOSCOPE Designed to record through continuous strip cameras similar to Fairchild F 246 A
MULTI-GUN CATHODE RAY TUBES Two, four, six, eight and ten gun tubes, potentiometer and radial deflection tubes
H-21 DUAL CHANNEL OSCILLOSCOPE Sensitivity better than 0.036 V rms per inch
CA-1 DC PRE-AMPLIFIER For strain gage applications Gain 150 times

THE ACCURATE, FLEXIBLE SOLUTION TO YOUR TOUGHEST JOBS!

Men in work similar to yours have successfully applied our Cathode Ray tubes, oscilloscopes and scope amplifiers in testing, production and research capacities where such equipment was never practical before.

In other instances our products have replaced less satisfactory equipment, doing the job with greater speed and accuracy than was possible previously.

You can benefit from our development program which is leading industry to new products, new refinements in existing products, new research methods and techniques.

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All scopes illustrated employ five inch flat-face tubes.

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RAWSON METERS

Types: 501A 501C

Accuracy: ½ of 1%

MULTIMETERS and REGULAR METERS
AC and DC types, high accuracy, multiple ranges, 2 microamperes to 1 ampere DC, 2 milliamperes to 3 amperes AC.

ELECTROSTATIC VOLTMETERS
Ranges 100-v. to 35,000-v. AC or DC. Resistance exceeds million megohms. Can measure static electricity.

FLUXMETERS
Laboratory and production measurements on magnets and magnetic circuits. Single push button return-to-zero.

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High sensitivities low power factors. New types soon to be announced.

Special apparatus built to order

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WIRES AND CABLES FOR B·I·W ELECTRONIC APPLICATIONS

HOOK-UP WIRE

A few constructions standardized to meet requirements of all branches of the Government Services are of best quality for commercial use.

TYPE SRIR WITH GLASS BRAID COVERING IN COLORS

Gauge Sizes: #24 to #8 stranded, also available solid or flexible.

Insulation: Black extruded synthetic resin, flameproof, oil resisting, easily stripped.

Covering: Closely woven fiberglass in solid colors: white, black, brown, red, orange, yellow, green, blue and any of 100 combinations.

Coating: Thoroughly coated and smoothly finished with tough flame resisting lacquer.

Voltage Rating: 1000 volts RMS operating, diameter no larger than ordinary 600 volt.

TYPE SRHT (Synthetic Resin High Temperature) is the designation for a series of electronic hook-up wires for high temperature applications. Generally they conform to the requirements of Spec. 15W9 and are made in all gauge sizes, #26 to #6 in all colors with four types of coverings to be serviceable under different conditions:

SRHT (GS): Rated at 200°C is silicone treated fibreglass braid shielded with a tinned copper braid.

TYPE SRIR: Plain colored plastic insulation striped in standard color combinations.

TYPE SRLV: With or without glass covering. Small diameter 300 volt rating in all colors for miniature wiring.

TYPE SRIR (J) WITH NYLON SHEATH: For extreme conditions of abrasion and moisture.

TYPE SRHV EITHER GLASS BRAID OR NYLON SHEATH: For voltage ratings 2500, 5000 and 7500.

TYPE ANRW WITH COTTON BRAID: For good abrasion and heat resistance—insulated with neoprene compound for 600 volts, withstands momentary baking at 250°F without damage—for leads on coils and transformers.

SRHT (NL): Rated at 125°C is nylon braid covered and finished with flexible flameproof lacquer.

SRHT (CV): Rated at 150°C is covered with a unique abrasion resistant braid saturated with silicone resin.

SRHT (GV): Rated at 200°C is covered with fibreglass braid saturated and finished with silicone resin.

PERFORMANCE DATA—TYPE SRHT

HEAT RESISTANCE: Withstands baking at 200°C for 96 hours followed by flexing and dielectric test.
COLD RESISTANCE: Withstands flexing at −55°C followed by dielectric test.
MOISTURE RESISTANCE: After immersion in hot water for one hour withstands dielectric test of 2500 volts and has an insulation resistance of 500 meg/M ft.
FLAME RESISTANCE: Self-extinguishing after exposure to 15 seconds flame test with sample held at 45° angle.

"TEFLEX" HIGH TEMPERATURE MOTOR AND TRANSFORMER LEAD CABLES

PATENTED

Designed to meet the requirements of electrical equipment operating at high temperatures—a flexible cable of higher dielectric strength and insulation resistance, smaller in diameter, flameproof, resistant to corrosive vapors, acids, and solvents. B.I.W. Teflex cables fill the need for high temperature cables operating in wet locations and severe conditions. They are made in two standard types. Both types are made in all sizes from #22 to #2AWG in 600 volt rating and in high voltage ratings as may be required from 1,000 to 50,000 volts.

BIW TYPE PFCV consists of flexible copper conductor insulated with a laminated layer of DuPont Teflon sealed with silicone to form a moisture-proof insulation which remains flexible after exposure to high processing temperatures and may be operated at 150°C continuously. Covered with a unique heat and abrasion resistant braid.

BIW TYPE PFRW similar to PFCV except that it has an external synthetic rubber sheath to provide more durability for heavy duty applications. This sheath will withstand varnish dipping and oven or infra-red baking. This type can be rated at higher temperatures and can carry higher power ratings than conventional cables.

HIGH and LOW TEMPERATURE FLEXIBLE COAXIAL CABLES

PATENTED

These cables employ the use of laminated "Teflon" tape insulation which remains flexible over temperatures from −80° to 500°F and withstands these temperatures with little change in electrical or physical properties.

The suffix "GV" refers to a Teflon tape and treated fibreglass outer covering which can be rated at 400°F, the same as the insulation.

The suffix "RS" is a neoprene sheath which is lower in cost but limits the temperature rating to 250°F.

The suffix "NL" refers to a lacquered nylon braid covering which can be rated at 200°F.

TYPE NO.	CONDUCTOR	O.D.	WEIGHT lbs./M'	CAP/ft. mmf.	OHMS Impedance	
COX-2FS-011-GL	.011" cw.	.075"	4.5	31.5	50	Miniature
COX-3FS-011-GL	.011" cw.	.090"	6.0	23.7	70	Miniature
COX-3FS-014-GL	.014" cw.	.100"	7.5	22.0	72	Miniature
COX-2FS-22-RS	#22 str.	.170	22.	30.	50	Small diameter flexible cables
COX-2FS-22-NL	#22 str.	.125"	16.	30.	50	
COX-2FS-22-GV	#22 str.	.125"	18.	30.	50	
COX-3FS-22-RS	#22 str.	.190"	25.	21.	71	
COX-3FS-026-GV	.026" cw.	.240"	50.	20.	73	Size of 58/U
COX-4FF-026-RS	.026" cw.	.250"	45.	14.	88	Equal to 62/U
COX-2FS-032-GV	#20 Ag	.195"	35.	26.	50	Size of 58/U
COX-2FS-20-RS	#20 str.	.195"	35.	37.	57	Equal to 58A/U
COX-2FS-20-GV	#20 str.	.165"	30.	36.	52	Equal to 58A/U
COX-2FS-16-GV	#16 st. Ag	.260"	95.	30.	50	Equal to 5A/U
COX-2FS-13-GV	#13 st. Ag	.365"	124.	34.	52	RG-115/U
COX-2FS-10-GV	#10 st Ag	.445"	250.	30.	52	RG-94/U
COX-2FS-5-GV	#5 st. Ag	.710"	475.	30.	52	RG-83/U

CUSTOM MADE MULTI-CONDUCTOR NEOPRENE SHEATHED CABLE

Examples from over 650 different designs of flexible cables made for the electrical industry to operate a certain device or to connect component equipment.

197

338

391

#197—3-50 ohm coaxials, 21 #22 insulated conductors for television cameras.

#338—4 #22 gauge 300 volt pairs each shielded and color identified.

#391—2 #14 high voltage, #14 ground 5 #18—300 volt control circuits.

WITH OUR ENGINEERING EXPERIENCE IN MANUFACTURING SPECIAL CABLES AND OUR WIDE RANGE OF PRODUCTS AND FACILITIES, WE ARE IN POSITION TO HELP SOLVE YOUR WIRE AND CABLE PROBLEMS AND WE SOLICIT YOUR INQUIRIES.

61 BAY STREET BOSTON INSULATED WIRE & CABLE CO. BOSTON 25, MASS.

STANDARD RI-FI* METERS

14kc to 1000mc!

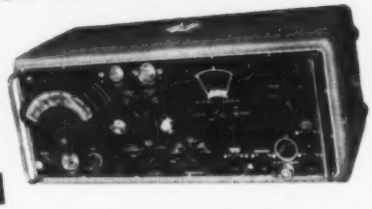
DEVELOPED BY **STODDART** FOR THE ARMED FORCES.

AVAILABLE COMMERCIALLY.

VHF!
15 MC to 400 MC
NMA - 5

Commercial equivalent of TS-587/U.
Sensitivity as two-terminal voltmeter, (95 ohms balanced) 2 microvolts 15-125 MC; .5 microvolts 88-400 MC. Field intensity measurements using calibrated dipole. Frequency range includes FM and TV Bands.

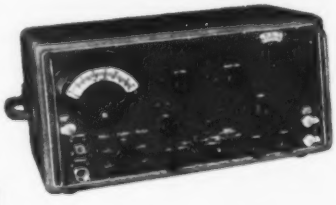
VLF!
14 KC to 250 KC
NM - 10A



Commercial equivalent of AN/URM-6.
A new achievement in sensitivity! Field intensity measurements, 1 microvolt-per-meter using rod; 10 microvolts-per-meter using shielded directive loop. As two-terminal voltmeter, 1 microvolt.

HF!
150 KC to 25 MC
NM - 20A

Commercial equivalent of AN/PRM-1.
Self-contained batteries. A.C. supply optional. Sensitivity as two-terminal voltmeter, 1 microvolt. Field intensity with ½ meter rod antenna, 2 microvolts-per-meter; rotatable loop supplied. Includes standard broadcast band, radio range, WWV, and communications frequencies.



UHF!
375 MC to 1000 MC
NM - 50A

Commercial equivalent of AN/URM-17.
Sensitivity as two-terminal voltmeter, (50-ohm coaxial input) 10 microvolts. Field intensity measurements using calibrated dipole. Frequency range includes Citizens Band and UHF color TV Band.

Since 1944 **Stoddart RI-FI*** instruments have established the standard for superior quality and unexcelled performance. These instruments fully comply with test equipment requirements of such radio interference specifications as JAN-I-225, ASA C63.2, 16E4/SHIPS), AN-I-24a, AN-I-42, AN-I-27a, AN-I-40 and others. Many of these specifications were written or revised to the standards of performance demonstrated in **Stoddart** equipment.

The **rugged** and **reliable** instruments illustrated above serve equally well in field or laboratory. Individually calibrated for consistent results using internal standard of reference. Meter scales marked in microvolts and DB above one microvolt. Function selector enables measurement of sinusoidal or complex waveforms, giving average, peak or quasi-peak values. Accessories provide means for measuring either conducted or radiated r.f. voltages. Graphic recorder available.

***Radio Interference and Field Intensity.**

Precision Attenuation for UHF!

Less than 1.2 VSWR to 3000 MC.
Turret Attenuator:
0, 10, 20, 30, 40, 50 DB.
Accuracy ± .5 DB.
Patents applied for.

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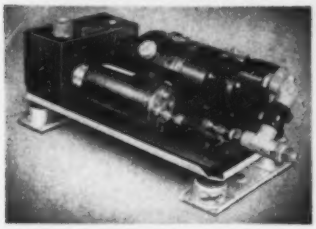
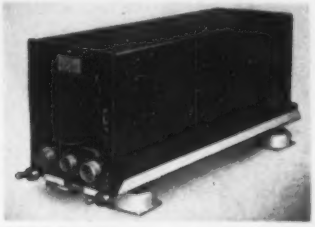
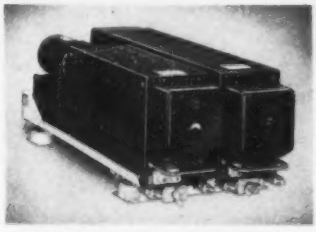
FOR ASSURED CONTROL
of SHOCK and VIBRATION



ECLIPSE-PIONEER Division of Bendix Aviation Corp. uses a BARRY Standard Mounting Base to safeguard accurate operation of its air pump and control unit for aircraft pressurization.



SPERRY Gyroscope Company protects the famous Zero Reader, a sensitive "super-instrument" for "blind" flying, from aircraft shock and vibration with unit air-damped BARRYMOUNTS.



COLLINS new vhf radio equipment, a full line of aircraft navigation and communications equipment, uses unit BARRYMOUNTS with a Collins-designed base.

RCA AVR-21, Automatic Direction Finder, mounted on Type M-112 BARRYMOUNTS, performs satisfactorily when subject to 10G vibration in any of three directions, without resonance above 13 cycles.

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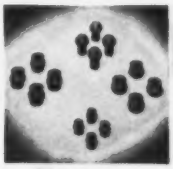

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For electronic components, tiny fractional H.P. motors, record changers, dictating machines, and other lightweight apparatus.

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For fans, motor generator sets, transformers, presses, other heavy industrial equipment.

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DESIGNED AND MANUFACTURED TO YOUR OWN SPECIFICATIONS

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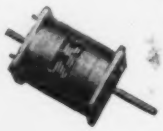
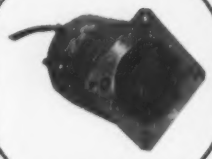


TYPE ALPJJDZ



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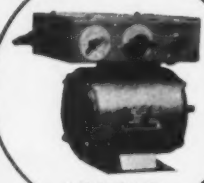

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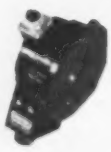

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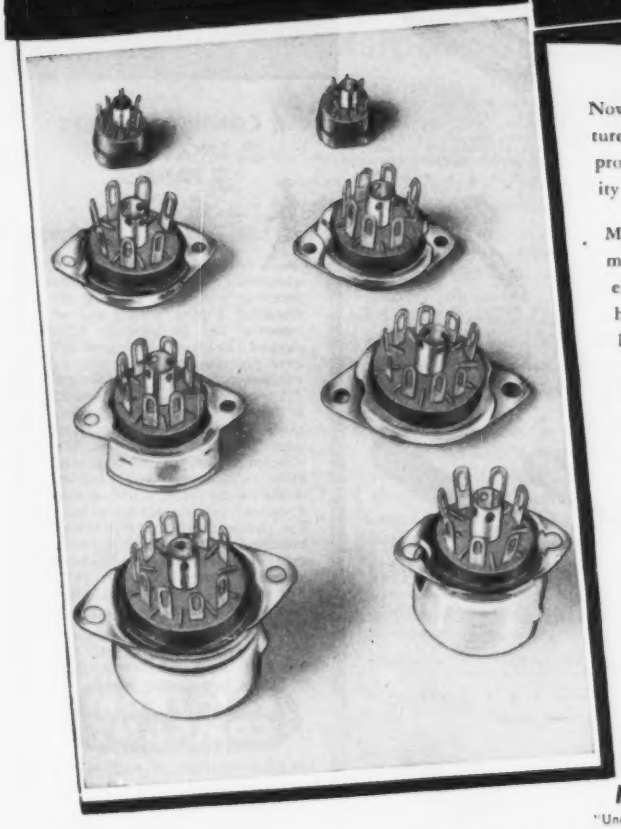
7-PIN and 9-PIN . . . and SUBMINIATURES

New Low Prices



Now MYCALEX offers both 7-pin and 9-pin miniature tube sockets . . . with superior low loss insulating properties, *at new low prices* that offer ceramic quality for the cost of phenolics.

MYCALEX miniature tube sockets are injection molded with precision that affords uniformity and extremely close tolerances. MYCALEX insulation has high dielectric strength, very low dielectric loss, high arc resistance and great dimensional stability.

Produced in two grades: MYCALEX 410 conforms to Grade L1 specifications, having a loss factor of only .015 at 1 MC. It is priced comparably with mica filled phenolics.

MYCALEX 410X is for applications where low cost of parts is vital. It has a loss factor only one fourth that of "everyday" quality insulating materials, and a cost no greater.

Prices gladly quoted on your specific requirements. Samples and data sheets by return mail. Our engineers will cooperate in solving your problems of design and cost.

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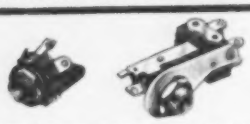

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"LITTEL-JAX"—require minimum panel space—available in most common circuits. Military types such as JK-33A (JJ-033) and JK-34A (JJ-024).

"SF-JAX"—short frame design—all circuits. Also to Military Specs.

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"T-JAX" — a conventional telephone switchboard design—in all standard circuits and to meet military specifications.

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PHONE PLUGS

SWITCHES: Push Button, Rotary and Lever Action

Illustrated are representative parts of the regular line. Send for catalogue No. S-49A.

Inquiries on custom-made components will receive our prompt attention.

"EXTENSION JAX" — for cable extensions. Features "Switchcraft" clamp type terminal for ample cable support. Available in 2- and 3- conductor circuits; Bakelite or Shielded Handles.

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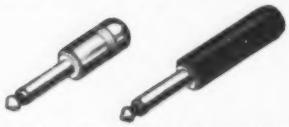
"LEV-R-SWITCH"—a lever action switch, unusual because of size, and requires only single hole for mounting. Available in numerable circuits; various contact materials.



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"LITTEL-PLUG" — small, fits standard Jacks — features clamp type terminal for cable support.

"LUG-PLUG" — small — low cost — high quality.

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Rugged yet small, a Push Button switch available in simple circuits, contacts to suit. Various colors of Buttons.

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Flat frame support spring "pile-up" in various circuits and contact combinations. "Easy" action of colored push buttons.

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Rotary switch, rugged frame supports spring "pile-ups" — minimum panel depth. 2-or-3 position, locking or non-locking action.

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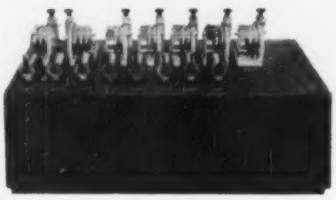

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No insulating material compares with MYCALEX 410 for today's exacting requirements — where advanced circuits and higher frequencies demand a *combination* of these properties:

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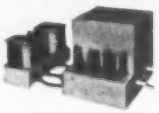
Input 110 V AC. Output 15 to 30 KV at regulation of .1% or better at one milliampere loads.
A 12 tube 30 KV unit with a variable 4 to 6 KV voltage tap for focus voltages for 5WP15 and 5WP6 Flying Spot tubes and 5TP4 Proj. kinescope.
A compact unit ideal for use with film recording or projection systems where it is imperative to keep picture size constant with changing beam current.



NET PRICE $250

SPELLMAN 20 TO 40 KV RF POWER SUPPLY

Available with either positive 40 KV output or negative 40 KV output. A compact unit adaptable for nuclear physics, electro-static painting, dust precipitation, insulation testing, television and other industrial uses.
The 20 KV variance in voltage is available through control on front panel. Output voltage supplied through 4 ft. length of safety High Voltage cable. If desired, cable lengths up to 50 feet are available at additional cost.

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Dimensions: L. 14 1/8", W. 11-1/8", H. 12 1/8"

Tubes: 1-5U4 Rectifier 2-6L6 Oscillator 2-1B3 HV Rectifier

INPUT: 110 Volts AC

VOLTAGE OUTPUT: 20 to 40 KV CURRENT OUTPUT: 500 Microamperes Unit includes pilot light, off-on switch and high voltage output control on front panel. Also available in standard relay rack mount at additional cost. Specify desired voltage when ordering.

A 30 KV television version of above unit with a variable 4 to 6 KV Voltage tap for focus voltages for 5TP4 kinescope, etc. is available .....

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COMPLETE LINE OF HI VOLTAGE RF STEP-UP COILS

We also have facilities for winding Hi Voltage RF step-up coils and transmitter coils to your specifications.

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The 25 KV and 35 KV coils will provide DC currents up to 3 milliamperes when used with a 5523 type rectifier tube.

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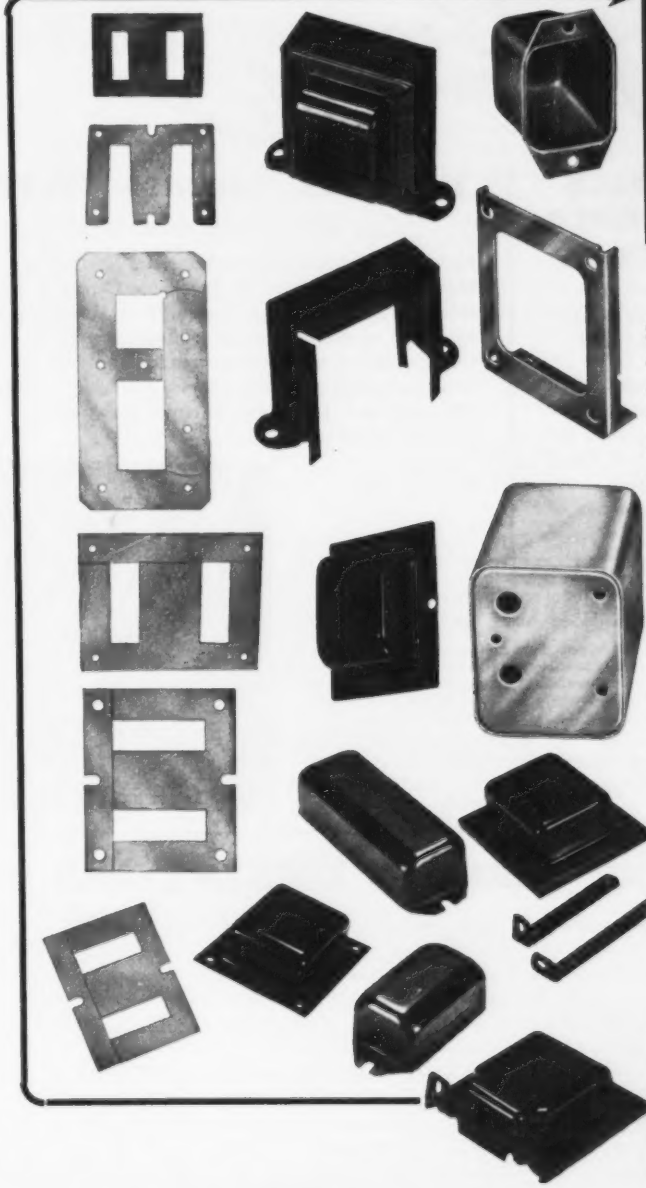

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Keep a copy of the Kobzy Catalog handy for reference. If you don't have one send for your copy.

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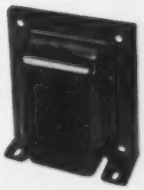

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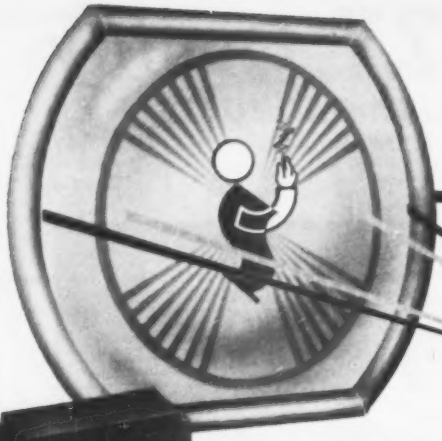
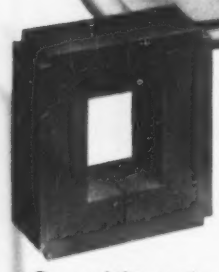


Ceramag® IRON CORES



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Many times the permeability in HALF THE USUAL SIZE

Permeability on the order of 10 to 1 by comparison with conventional iron cores for flyback transformer applications is readily possible with the new Stackpole Ceramag types. In addition, Ceramag cores are much smaller, have higher resistance, and operate cooler due to the absence of eddy current losses.

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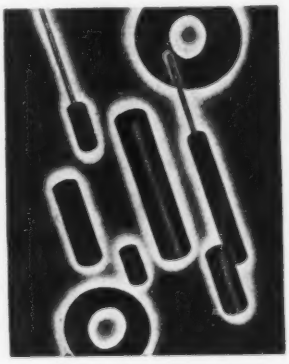
. . . 37% more effective!

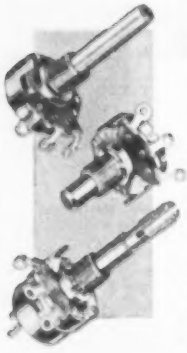
Molded of a unique ceramic material having exceptionally high permeability, Stackpole Ceramag iron cores bring new, higher standards of efficiency to television horizontal image deflection circuits. In screen areas where there is a sudden voltage drop, Ceramag cores give ratios of from 1 to 8 or more compared with 1:5 for conventional high permeability types. Write for complete details and samples.



STANDARD AND SPECIAL IRON CORES

The rapid increase in the use of molded iron cores throughout electronic engineering has resulted in large part from Stackpole engineering that has made new and improved types available in a wide assortment of shapes, sizes and ranges. Special Stackpole manufacturing techniques assure cores of outstanding dependability for exacting specifications. Write for details on any type.

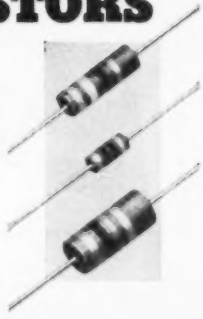
STANDARD AND HIGH-FREQUENCY TYPES — SIDE-MOLDED CORES
HIGH-RESISTIVITY CORES — IRON CORES FOR CHOKE COILS — IRON SLEEVE CORES
THREADED CORES — CUP CORES — INSULATED CORES
MOLDED COIL FORMS — CERAMAG® CORES

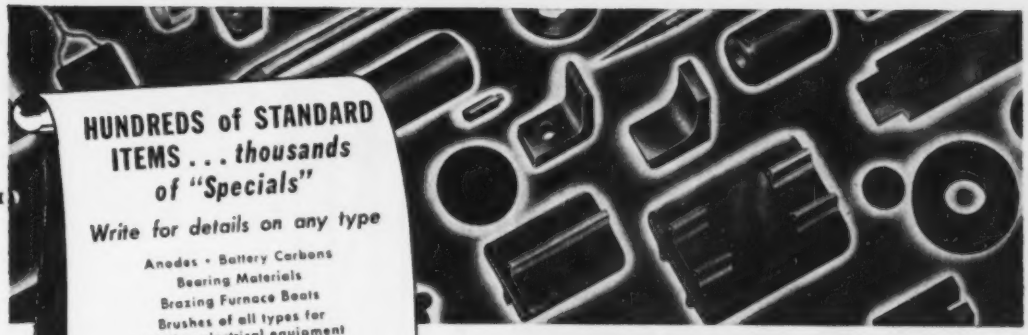


FIXED AND VARIABLE RESISTORS

Stackpole variable resistors are made in a complete, fully tested and proved line for modern television, radio and other electronic requirements. Economically produced in large quantities by modern methods, each unit is backed with many years of specialized experience in meeting the specifications of leading equipment manufacturers. Recent types include many special controls, including dual concentric shaft controls and other types for specific television uses.

Stackpole fixed resistors of molded carbon composition are available in ½-, 1- and 2-watt sizes in all standard ranges. Tolerances, insulation, moisture and overload characteristics match today's exacting specifications. *Special resistors include capacitor discharge, protective surge, lightning arrester, ignition suppressor and other types.*





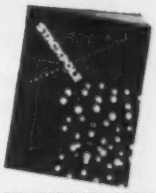
HUNDREDS of STANDARD ITEMS . . . *thousands of "Specials"*

Write for details on any type

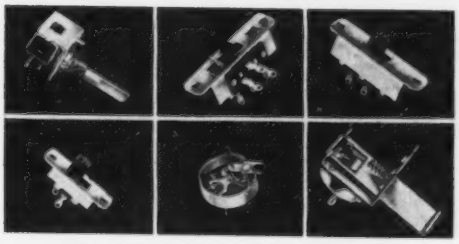
Anodes • Battery Carbons
Bearing Materials
Brazing Furnace Boats
Brushes of all types for rotating electrical equipment
Carbon and Graphite Contacts
Chemical Carbons • Clutch Rings
Dash Pot Plungers
Electric Furnace Heating Elements
Electrolytic Anodes • Friction Segments
Glass Molds • Ground Rods (carbon)
Mercury Arc Rectifier Anodes
Metal-Graphite Contacts
Power Tube Anodes
Rail Bonding Molds
Rare Metal Contacts
Resistance Welding and Brazing Tips
Seal Rings (for gas or liquid)
Special Molds and Dies
Spectrographite No. 1
Trolley and Pantograph Shoes
Voltage Regulator Discs
Water Heater and Pasteurization Electrodes
Welding Carbons
Welding Plates and Paste

CARBON-GRAPHITE SPECIALTIES

The unique electrical, mechanical, physical and chemical properties of Stackpole carbon, graphite and molded carbon-graphite products solve countless problems of friction, temperature, arcing, corrosion, shaft sealing, voltage regulation and others. So broad is the line of Stackpole products in this field, so extensive the facilities for "specials" that it is practical to list only a few of them here. Stackpole engineers welcome the opportunity to assist in adapting any of these products to your specific design, engineering or production requirements.



GET THIS DATA BOOK! Stackpole Booklet 40 contains a wealth of helpful data on carbon, graphite and carbon-graphite engineering uses. Write on company stationery.



LINE SWITCHES for Stackpole Controls

Only .888" in diameter by .312" thick, the Stackpole A-10 DP ST line switch fits even the smallest Stackpole variable resistor controls. Rated 1 amp. 250 volts AC-DC or 3 amps. 125 volts it combines outstanding ruggedness with ample-sized contacts and positive contact wiping action. Ideal for long, trouble-free service for portable and auto radios and numerous other uses. A similar single-pole design, Type A-11, with or without dummy terminal will soon be available.

INEXPENSIVE LINE AND SLIDE SWITCHES including new 3 amp. types

Dress up your product—add to its convenience and "saleability" with these sturdy, low-cost switches! 18 fractional amperage and new 3 amp. types are available. Modifications can be produced economically for quantity users. Write for Switch Bulletin RC7C. State details of your application for samples.

SEND FOR COMPLETE DATA

Catalog RC7 listing the complete line-up of Stackpole Electronic Component Specialties will gladly be sent on letterhead request. Write for your copy today.

STACKPOLE SPECIALTIES

TINY GA CAPACITORS

Stackpole GA Capacitors cost no more than "gimmicks" and assure far greater stability, higher Q, better insulation resistance and higher breakdown voltage. Moreover, they are mechanically superior and eliminate the inductive characteristic of twisted wires. Capacities of 0.5; 0.68; 1.0; 1.5; 2.2; 3.3 and 4.7 mmfd. are available. ±20% tolerance.

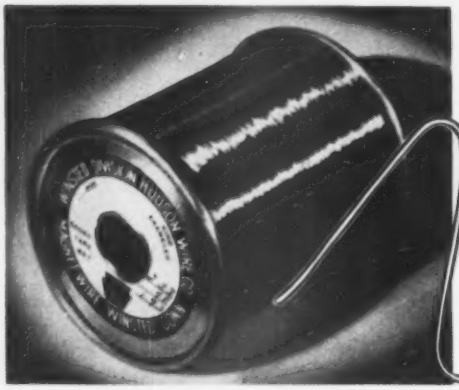
BAKELITE COIL FORMS

Stackpole molded coil forms are the modern answer to the need for inexpensive mechanical supports for windings. Cost is low, space factor is reduced, assembly is easier and point-to-point wiring is feasible with far fewer soldered connections. Write for details and samples to your specifications.

STACKPOLE

Electronic Components Division

STACKPOLE CARBON COMPANY, ST. MARYS, PA.



FINE Wire

CUSTOM-DRAWN AND INSULATED

FINE WIRES
(HUDSON & WINSTED DIVISIONS)

Hudson Wire Company specializes in fine wires custom-drawn and insulated to your critical requirements as to size, material, insulation. Your consideration is called particularly to the finest wire sizes—Nos. 44 to 50 or .0020 to .0010 nominal bare, and .00225 to .0012 nominal enamel.

BARE WIRES
(HUDSON WIRE DIVISION)

Copper
Brass
Zinc
Tinsel
Tin
Nickel-silver
Cadmium
Oxygen-free Copper
Silver-plated Bronze
Phosphor-bronze
Silver
Monel
Specialty Wires
Lead Wire
Fuse Wire

ENAMELED WIRES
(WINSTED DIVISION)

MATERIALS	TYPES	COVERINGS
Copper	Instrument Tubing	Plain and Heavy Enamel
Aluminum	Litz	Formvar
Resistance Alloy	Twisted	EZsol (Liquid Nylon)
Iron		Cement-coated Enamel
Copper-clad Steel		

TEXTILE-COVERED WIRES
(WINSTED DIVISION)

Nylon
Celanese
Silk
Cotton
Rayon
Fiberglas

All available on bare or enameled wire, single or double covered.

• LET US WORK WITH YOU

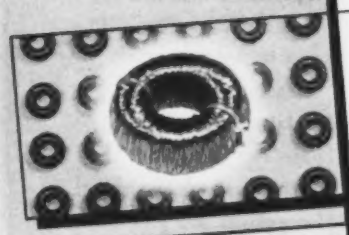
IN MEETING YOUR REQUIREMENTS

LITERATURE ON REQUEST

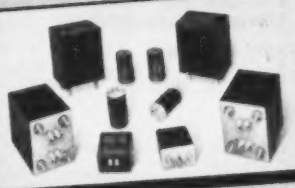
HUDSON WIRE COMPANY

BARE WIRES **GENERAL OFFICES: OSSINING, N.Y. • WINSTED DIVISION: WINSTED, CONN.** INSULATED WIRES

B&W QUALITY LINE FOR...

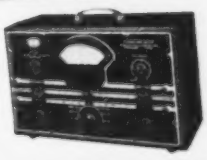


COILS—TOROIDS: with maximum inductance and high Q in a minimum of space • AIR-WOUND INDUCTORS: handling power inputs from zero to 1000 watts... available with fixed, center, end or variable center links. MINIDUCTORS: in sizes as small as ½" in dia. TURRET ASSEMBLIES: for powers of 25 to 150 watts ... covering the 160 to 10 meter bands • Single layer solenoid coils • Universal wound coils of single, multiple pie, and progressive construction • RF, IF, and Oscillator Coils • Traps, Discriminators, RF, and Delay Line Chokes, fabricated to your specifications.



FILTERS—HIGH PASS • LOW PASS • BAND PASS • BAND SUPPRESSION OR REJECTION • For use in RF or audio filtering ... for line RF suppression ... for harmonic attenuation ... for teletype communications ... for single side band and telemetering equipment. Each designed, built, and proved to offer a combination of accuracy and ruggedness under the most severe operating conditions.

VARIABLE CAPACITORS—of distinctive B&W butterfly design, offer features not available in conventional types. Opposed stator sections provide short RF paths. Permit mounting coil assembly directly on stator sections, completely eliminating closed circuit wiring. Available in two types: CX Heavy Duty unit with up to ½" Air Gap; JCX Medium Duty type with ¼ the frontal area of the above type and having ⅛" Air Gap.



TEST EQUIPMENT—AUDIO OSCILLATOR: for low distortion source of freqs. between 30 and 30,000 cycles. DISTORTION METER: will check fundamentals from 30 to 15,000 CPS measuring harmonics to 45,000 cycles ... residual noise is less than .025%. FREQUENCY METER: for frequencies up to 30,000 cycles. Operates on any wave form with peak ratio under 8 to 1. SINE WAVE CLIPPER: speeds analysis of audio circuits ... simplifies selection of components at fractional cost of square wave generator.

SPECIAL APPARATUS—Complete systems of VHF radio relay equipment, mobile frequency shift radio teletype equipment, and point-to-point frequency shift radio teletype—including low, medium, and high power transmitters ... high power RF amplifiers ... frequency shift radio teletype exciters, dual diversity, and single channel radio teletype receiver converters ... control units ... direction finding equipment—to answer the communication needs of governments and commercial organizations the world over.

FULL DETAILS ON ANY OF THE ABOVE PRODUCTS ARE AVAILABLE IN B&W FREE BULLETINS AND CATALOGS. WRITE DEPT. EY-60.

BARKER & WILLIAMSON, INC.

237 FAIRFIELD AVENUE — UPPER DARBY, PENNA.

For Fast, Low-cost Assembly

—Use these

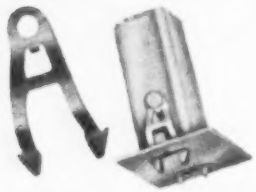
PALNUT

TRADEMARK

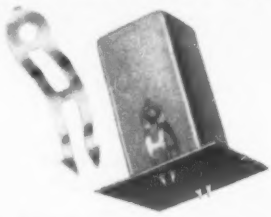
Vibration-proof Fasteners

PALNUT SHIELD CAN FASTENERS

No. 702 for miniature cans



No. 591 for 1" square or larger



★ Strong, positive grip ★ No tolerance problem ★ Low assembly cost

A quick snap of PALNUT Shield Can Fasteners into the chassis provides a secure job, speedily assembled at low cost. Live spring arch holds can tightly against chassis; will not pull out unless deliberately released. Good ground contact. Use on any chassis thickness.

PALNUT COIL TUBE FASTENERS for .283" and .375" O.D. Tubes

(Above) For threaded studs

(Above) For threaded cores

A QUICK, LOW-COST, EFFICIENT MEANS OF MOUNTING COILS TO CHASSIS OR TERMINAL BOARD. DOES THREE JOBS AT ONCE:

1. Thread design eliminates axial motion of core, maintains accurate settings. Tension is smooth, with negligible thread wear.

2. Gripping points allow easy insertion of tube, then grip with maximum resistance to rotational torque and "pull out".

3. Resilient side arms yield to clear mounting hole in chassis; once clear, arms snap open, securely holding coil in mounted position.

Write on Company letterhead for samples and engineering data.

THE PALNUT COMPANY 77 Cordier Street, Irvington 11, N. J.

PALNUT SELF-LOCKING NUTS and FASTENERS for quick, secure fastening at low cost

REFERENCE SHEET SECTION

A popular feature
of ELECTRONICS
since its first issue
has been
its Reference Sheets...
pages that constitute
graphical and tabular shortcuts
for engineers who
design, produce, install
and maintain
electronic equipment.

•

21 of these sheets that
have proven generally useful
over the years
are presented again
in this book. Many of these
have been revised
and brought up-to-date.
In addition, a complete index
of all the
engineering Reference Sheets
that have appeared
in ELECTRONICS,
since its first issue
April 1930, is
included in this book.

electronics BUYERS' GUIDE

THE 13th ISSUE OF ELECTRONICS

BETA HIGH VOLTAGE POWER SUPPLIES

200 to 250,000 VOLTS DC
10 μa to 10 AMPERES
REGULATED OR UNREGULATED
Special features as required

Standard products include:

KILOVOLTMETERS:
Up to 50 KV at 50,000 ohms per volt. 20 μa drain. Higher drains up to 150 KV.

PORTABLE POWER SUPPLIES:
Adjustable from 0 to 30 KV DC. Regulated or unregulated units available.

PORTABLE PROJECTION OSCILLOSCOPES:
Case–19" x 16" x 13"; Picture–16" x 12".

AND OTHER ELECTRONIC MEASURING EQUIPMENT

Send for product literature, and our High Voltage DC Power Supply specification booklet for your special High Voltage Power Supply requirements.

Field Engineers throughout the country are at your service to discuss our products more thoroughly with you.

BETA ELECTRIC CORP.
1762 Third Ave., New York 29

this BOOK
now in its .... 10th year

has earned industry-wide acceptance as the only complete and accurate source of buying information for all types of electronic and allied products ..... components and complete equipment

In Addition, this year . . .

V tells who has what in production or available in a reasonable time and unrestricted for general industrial use.

electronics BUYERS' GUIDE

Please mention this book when buying or inquiring from it.

REEVES Soundcraft

SOUND-RECORDING MEDIA

The NEW Soundcraft 'constant output' magnetic recording tape now in production at the new Long Island City plant establishes Soundcraft as Recording Media Headquarters.

'PLAYBACK, AUDITION and BROADCASTER' DISCS,
'CONSTANT OUTPUT' MAGNETIC TAPE
SAPPHIRE STYLI

REEVES — "20 YEARS WITH SOUND RECORDING MEDIA."

REEVES Soundcraft CORP.
35-54 36th STREET, LONG ISLAND CITY 6, N. Y.

TEST EQUIPMENT

INSULATION TESTER

Model 184C

$853.00
Net

For accurate insulation resistance, dielectric absorption, and hi-pot testing over variable range 50 to 10,000 v. DC. Four current ranges: 30, 150, 300 and 1500 microamperes allow sensitive readings for particular requirement, plus sufficient output for quick charging of high capacities. Measures resistances from 0.1 to 50,000 megohms. Constant output voltage regulated to ½%.

Neon lamp indicates breakdown and guards meters against overload. Automatic relay removes residual capacitance charges. Limiting resistors protect power supply. Local and remote line switch operation. Polarity reversing switch. Guard circuit connection. Oak case, brass hardware, all cables supplied. Weight 60 lbs. Operates from 115 v., 60 cycles, 65 watts.

RF PROBE

Model 200A

$19.50
Net

Indicates presence and relative strength of RF from 200 kc. to 500 mc. For adjusting antennas and transmitters, neutralizing RF amplifiers, eliminating harmonic radiation, servicing chokes and oscillators, detecting parasitics, determining standing wave ratios. No tuning required. Insulated handle for safety in high voltage circuits. Weston 506 meter

SIGNAL TRACER

Model 416

$64.50
Net

Smallest unit available. New design contains special Weston output meter, calibrated attenuator measures gain from 1 to 10K, jacks for 'scope or VTVM, pilot light, AF and RF probes, test leads, ground lead, power cord and headphones. Size 5¼ x 3½ x 3. Weight 2 lbs. Operates on 115 v., 50–1600 cycles, 7 watts.

Frequency range:
47 cps. to 400 mcs.

AF sensitivity:
0.002 v. audible.
0.004 v. at ½-scale.

RF sensitivity:
0.005 v. modulated 50%.
0.05 v. modulated 50% ½-scale.

Distortion:
<1% at 100 cps.
<½% at 10 kc.

Output at 'scope—VTVM jack > 2 volts for full scale meter reading.

OHM-BOX

Model 415

$17.50
Net

A new tool combining resistance decade and substitution box. Choice of twelve million resistance values in bakelite box 4½ x 4⅞ x 2¼. Any single value or combination, in series or parallel, quickly set up with 8 double-ended patch cords and 4 leads supplied. Non-inductive JAN resistors rated at 2 watts, ±5%. One ohm to 12 megohms.

OTHER RFL PRODUCTS

MAGNET CHARGER

Model 107

$490.00
Net

Condenser discharge type. Charges any shape or kind of magnet saturable with 15,000-ampere peak charging current. Accessory Model 206 Booster increases charging current above 20,000 amps. Special adapters for all standard instruments and many odd shapes. Operation is safe, simple, swift. 115 v., 60 cycles, 25 watts. Size 7 x 12 x 17. Weight 75 lbs.

SEALNUTS

Type H-1267

Type H-1268

Type H-2475

Sealing and mounting nuts for toggle, rotary shaft and push-button switches. Seal out dirt, moisture, fumes. Protect from adverse weather. Neoprene caps flexible below —40°C. Nuts are nickel plated brass. Approved by Government services. Types H-1267 and H-2475 fit $\frac{15}{32}$–32 thread, type H-1268 fits $\frac{3}{8}$–32 thread. Positive protection at low cost.

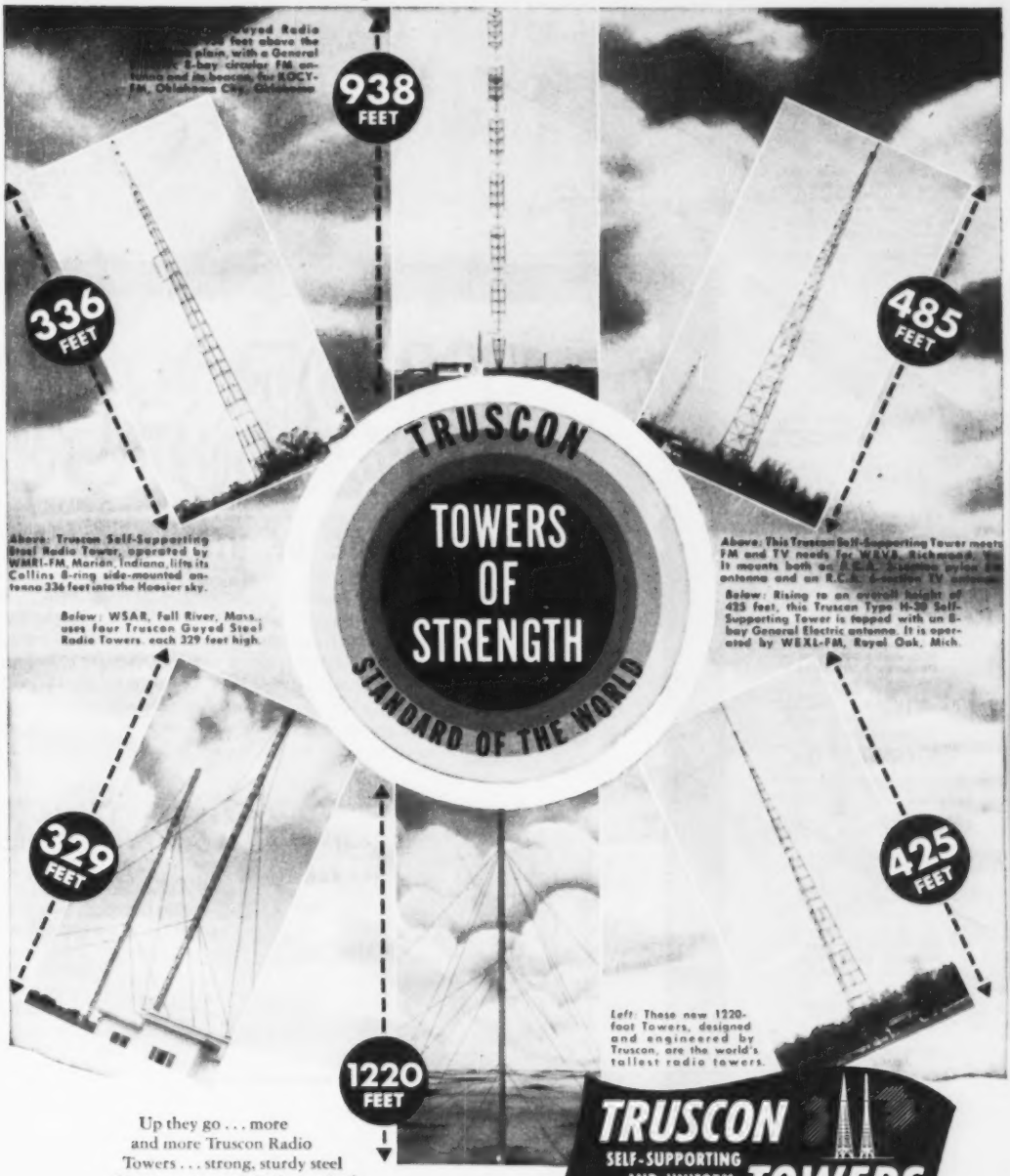
Contact nearest office listed below for free literature on any RFL product or service.

Albany 7 Schieler Electric Co., Inc. 100 State St.
Atlanta 3 E. A. Thornwell 217 Whitehall St. S. W.
Boston 16 Cowperthwait and Bradhead 131 Clarendon St.
Buffalo 3 Schieler Electric Co., Inc. 527 Ellicott Square
Charlotte 12 Bassen, Wallace & Co. 116½ East Fourth St.
Chicago 6 George Petitt Company 549 W. Washington Blvd.
Cincinnati 37 Beedle Equipment Co. Roselawn Center Building
Cleveland 14 Ambos-Jones Company 1965 The Arcade
Denver 2 Peterson Company 4348 Colorado Blvd.
Detroit 2 T. S. Carwthorne 570 Maccabees Bldg.
Houston Lynn Elliott Co. 322 M & M Bldg.
Jacksonville 2 Ward Engineering Co. 302 Hildebrandt Bldg.
Knoxville A. R. Hough Co. P.O. Box 1452
Little Rock Curtis H. Stout Box 107
Los Angeles 27 Edward S. Sievers 5171 Hollywood Blvd.
Meriden John S. Iddale 144 Curtis St.
Minneapolis 2 Georges & Pinkney Co. 552 Plymouth Bldg.
New Orleans 12 W. J. Keller 304 Natchez Bldg.
Orlando Ward Engineering Co. 1217 W. Central Ave.
Philadelphia 2 Instrumen. Craig & Co. 112 South 16th St.
Phoenix I. E. Redmond Co. 400 W. Madison St.
Pittsburgh 22 Russell F. Clark Co. 1404 Clark Bldg.
Rochester 4 Schieler Electric Co., Inc. 311 Alexander St.
San Francisco 5 H. E. Held 120 Main St.
Seattle 4 Eicher & Company 263 Colman Bldg.
St. Louis 1 C. B. Fall Co. 317 No. 11th St.
Syracuse 2 Schieler Electric Co., Inc. 204 State Tower Bldg.
Tulsa 1 Riddle & Hubbell 211 Midco Bldg.

Field Engineering Office: Electronic Engineering & Service Co., 1624 Eye St. N. W., Washington 6, D. C.

All prices are f.o.b. Boonton, N. J. subject to change without notice.

RADIO FREQUENCY LABORATORIES INC.
Boonton 2, New Jersey


938 FEET
336 FEET
485 FEET
329 FEET
425 FEET
1220 FEET
TRUSCON
TOWERS OF STRENGTH
STANDARD OF THE WORLD
Above: Truscon Self-Supporting Steel Radio Tower, operated by WMRI-FM, Marion, Indiana, lifts its Collins 8-ring side-mounted antenna 336 feet into the Hoosier sky.
Below: WSAR, Fall River, Mass., uses four Truscon Guyed Steel Radio Towers, each 329 feet high.
Above: This Truscon Self-Supporting Tower meets FM and TV needs for WAVA, Richmond, Va. It mounts both an R.C.A. 5-stacker nylon FM antenna and an R.C.A. 6-section TV antenna.
Below: Rising to an overall height of 425 feet, this Truscon Type H-30 Self-Supporting Tower is topped with an 8-bay General Electric antenna. It is operated by WEXL-FM, Royal Oak, Mich.
Left: These new 1220-foot Towers, designed and engineered by Truscon, are the world's tallest radio towers.

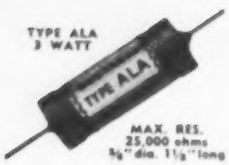
Up they go . . . more and more Truscon Radio Towers . . . strong, sturdy steel fingers setting new high standards of antenna performance . . . reaching far out to serve audio and video broadcasters and their audiences everywhere. The six new towers shown here vary from 329 feet to a lofty 1220 feet, yet all have one characteristic in common—*each is designed to meet exactly the particular operating and geographical needs of its specific location.* Truscon draws upon a background of world-wide experience to engineer and erect exactly the tower you need—tall or small . . . guyed or self-supporting . . . tapered or uniform in cross-section for AM, FM and TV transmission. Your phone call or letter to any convenient Truscon district office, or to our home office in Youngstown, will bring you immediate, capable engineering assistance. Call or write today.

TRUSCON SELF-SUPPORTING AND UNIFORM CROSS SECTION GUYED TOWERS

COPPER GROUND SCREEN

TRUSCON STEEL COMPANY
YOUNGSTOWN 1, OHIO
Subsidiary of Republic Steel Corporation

TYPE ALA
3 WATT



MAX. RES.
25,000 ohms
⅝" dia. 1⅛" long

TYPE LL
¼ WATT

MAX. RES.
0.2 Megohm
⅛" dia. ¼" long

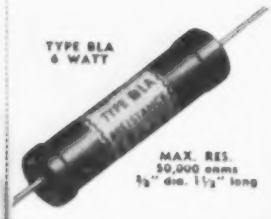
TYPE KL
½ WATT

MAX. RES.
0.5 Megohm
⅜" dia. 1-3/16" long

TYPE RL
½ WATT

MAX. RES.
0.5 Megohm
½" dia. ½" long

TYPE BLA
6 WATT



MAX. RES.
50,000 ohms
⅝" dia. 1⅛" long

TYPE WLA
1 WATT
INDUCTIVE*

MAX. RESISTANCE
331 Alloy 15,000 ohms
Nichrome 8,000 ohms
Manganin 2,500 ohms

BODY SIZE
3/16" dia. 1" long
TOLERANCE
Standard—1%
*WLAN ⅛ (NON-INDUCTIVE)
50% LOWER MAX. RES.

TYPE WLA
⅛-½ WATT
INDUCTIVE*

MAX. RESISTANCE
331 Alloy 7,500 ohms
Nichrome 4,000 ohms
Manganin 1,250 ohms

BODY SIZE
3/16" dia. ⅛" long
TOLERANCE
Standard—1%
*WLAN ⅛ (NON-INDUCTIVE)
50% LOWER MAX. RES.

CUSTOM BUILT RESISTORS

INSTRUMENT RESISTORS COMPANY builds resistors to your specifications for special applications. All are produced to close tolerance to meet any unusual custom requirements. IN-RES-CO can supply wire-wound resistors in large or small quantity to practically any electrical and mechanical specification on short notice. Inquiries are invited and quotations will be supplied upon receipt of specifications and information regarding quantity desired.

IN-RES-CO

A COMPLETE LINE OF HIGH ACCURACY

IN-RES-CO high quality wire wound resistors are designed to meet the need of the Electronic and Instrumentation industries with dependable resistors of closer tolerances, proven performance and practical cost. Instrument Resistors Company, through constant expansion of its facilities and continuous modernization, keep pace with the wire wound resistor requirements of all phases of the electrical field. Consequently, the equipment manufacturer can obtain IN-RES-CO wire wound resistive components at prices fully reflecting the economy of mass production and built to a standard of quality that can only result from exclusive specialization in the manufacture of these products.

IN-RES-CO TYPE IR WIRE WOUND RESISTORS

For use where space is at a premium! Combining midget size and extremely low cost with precision quality and performance. IN-RES-CO TYPE IR resistors meet all requirements where precision resistance values and exceptionally small size must be satisfied at lowest possible cost. Although no larger than molded resistors, type IR units are wire-wound to a standard tolerance of ± 1% and maintain this accuracy throughout their life. They withstand rough usage and intermittent over-load in continuous service.

Type	Max. Res.*	Max. Watts	Body Dia.	Body Length	Leads
IR-107	1200	1/8	7/64"	3/8"	.025" x 1-1/2"
IR-125	2500	1/4	1/8"	1/2"	.025" x 1-1/2"
IR-156	3500	1/2	5/32"	1/2"	.028" x 1-1/2"
IR-187	6000	1	3/16"	3/4"	.028" x 1-1/2"
IR-250	12000	2	1/4"	1"	.035" x 1-1/2"
IR-375	28000	5	3/8"	1-1/2"	.040" x 1-1/2"

*Maximum resistance using .00135" dia. wire. Higher ohmic values can be furnished using smaller wire.

TYPE SL
1 WATT

MAX. RES.
1 Megohm
½" dia. 1" long

TYPE P-4
1 WATT

MAX. RES.
1.0 Megohm
9/16" dia. 1" long

TYPE P-2
½ WATT

MAX. RES.
300,000 ohms
9/16" dia. 9/16" long

TYPE RN
NON-INDUCTIVE
Tropi-Prof

MAX. RESISTANCE
331 Alloy 500,000 ohms
Nichrome (R) 400,000 ohms
Manganin 15,000 ohms
TOLERANCE
0.5% standard to 0.1% at slightly higher cost

TYPE RX
NON-INDUCTIVE
Tropi-Prof

MAX. RESISTANCE
331 Alloy 500,000 ohms
Nichrome (R) 350,000 ohms
Manganin 30,000 ohms
TOLERANCE
0.5% standard to 0.1% at slightly higher cost

TYPE CX
½ WATT
Non-Inductive

MAX. RESISTANCE
331 Alloy 750,000 ohms
Nichrome 500,000 ohms
Manganin 15,000 ohms

BODY SIZE
9/16" dia. ⅝" long
TOLERANCES
Standard—1%
SPECIAL—TO 1/10%

TYPE BX
1 WATT
NON-INDUCTIVE

MAX. RESISTANCE
331 Alloy 1.5 Megohm
Nichrome 1.0 Megohm
Manganin 30,000 ohms

BODY SIZE
9/16" dia. 1" long
TOLERANCES
Standard—1%
SPECIAL—TO 1/10%

APPLICATION-DESIGNED WIRE WOUND RESISTORS

RESISTIVE COMPONENTS FOR EVERY NEED

IN-RES-CO wire wound resistors offer the circuit designer a new opportunity to meet increasingly critical requirements. The IN-RES-CO line is complete—resistance ranges from .01 ohm to several megohms; power ratings from a fraction of a watt to 10 watts. Special units are included for counteracting high humidity, fungus, space limitations, temperature rise, etc. Units can be supplied either inductive or non-inductive, wound with Nichrome, Manganin or 331 Alloy. For complete data, send for the new IN-RES-CO catalog.

IMPORTANT ANNOUNCEMENT!

THE NEW IN-RES-CO LINE OF MINIATURE and SUB-MINIATURE RESISTORS

IN-RES-CO announces a NEW LINE of MINIATURE and SUB-MINIATURE RESISTORS, to meet demand for a resistor of close tolerance and high resistance, yet small enough to meet limited space requirements in the new trend toward reducing size of electronic equipment. Due to space limitations it would be impossible to list all types available. However, our catalog lists all new items plus our standard and special line of resistors. See the IN-RES-CO catalog before designing that new equipment. You are sure to find just the resistor you require. If you can't find it there it isn't being made—but we can make it.

INSTRUMENT RESISTORS COMPANY

1036 COMMERCE AVENUE IN-RES-CO UNION, NEW JERSEY

MANUFACTURERS OF WIRE WOUND RESISTORS FOR EVERY ELECTRICAL AND ELECTRONIC NEED

RF CHOKE COILS

INSTRUMENT RESISTORS COMPANY specializes in the manufacture of RF choke coils wound to any specified inductance and Q value. Coils in this category are precision wound on ultra-modern winding equipment that insures finest product quality at lowest cost. IN-RES-CO is equipped to supply units of these types or others, including hermetically sealed units, in large or small quantity to exact specification. For prompt quotation on your requirements, call or write outlining specifications and quantity.

Over 1000 Sizes

PARAMOUNT SPIRAL WOUND PAPER TUBES

SEND FOR ARBOR LIST OF OVER 1000 SIZES

Convenient, helpful listing of over 1000 stock arbors. Includes many odd sizes of square and rectangular tubes. Write for Arbor List today. No obligation.

Square • Rectangular • Triangular
Round and Half-Round

With a wide range of stock arbors . . . plus the specialized ability to engineer special tubes . . . PARAMOUNT can produce the exact shape and size you need for coil forms or other uses. *Hi-Dielectric, Hi-Strength.* Kraft, Fish Paper, Red Rope, or any combination, wound on automatic machines. Tolerances plus or minus .002". Made to your specifications or engineered for YOU.

Inside Perimeters from .592" to 19.0"

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Manufacturers of Paper Tubing for the Electrical Industry

a + value for industry

Development and Production of

SPECIAL PURPOSE VACUUM TUBES BY ECLIPSE-PIONEER

TT-1 3000 mc Temperature Limited Noise Diode Tube.

Y-Type Position Convection—Vertical Sensing Tube.

Chronotron Thermal Time Delay Tube.

We're not in the standard vacuum tube business. But we are definitely in the business of developing and manufacturing special purpose vacuum tubes — tubes that are not generally available. During the past three years, for example, our facilities have produced, such devices as the Chronotron thermal time delay tube, the Convectron® vertical sensing tube, the TT-1 3000 mc temperature limited noise diode tube, counter tubes, glass enclosed spark gaps, and phono pickup tubes. Quantities of all these are now serving many phases of industry in a wide variety of applications. We invite your use of our facilities to develop and produce your requirements of special purpose vacuum tubes. Your inquiries concerning the scope of our facilities or details of any of our tubes will be given immediate attention.

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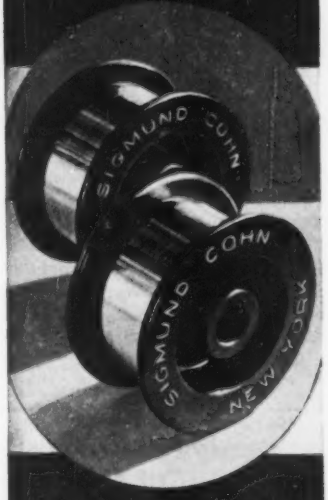


Made to meet your specifications for gold content and diameter . . .

Write for details and list of products

SIGMUND COHN CORP.
44 GOLD ST., NEW YORK
SINCE 1901

The Complete Line of

FREQUENCY STANDARDS

18 DIFFERENT STANDARD MODELS

We supply a complete line of units from our Model 64 miniature type to Model 200-IN 200 watt inverter. At present we have 15 different models of frequency standard units and 3 models of dividers. The dividers are suitable for use with almost any type frequency standard (based on 100 K.C. or nearby frequencies).

WE CAN SUPPLY TIME STANDARDS for SIDEREAL TIME as well as MEAN TIME. AS A RULE WE KEEP A FEW UNITS OF THE MORE POPULAR TYPES IN STOCK FOR IMMEDIATE DELIVERY.

The frequency stability depends on the customers specifications. We use different types of crystals for different requirements. Stability of 1 part in 10 million is obtainable in our units. One observatory that is using our time standards reports that the stability expressed in time is within 3 or 4 milliseconds per day.

Our business is based on two factors. Twenty years of almost uninterrupted specializing in "constant frequency" and a new radically improved type of frequency divider. Space does not allow us to elaborate on the design of the dividers. It may be mentioned that tests (outside our own laboratory) showed several advantages over other types of divider circuits.

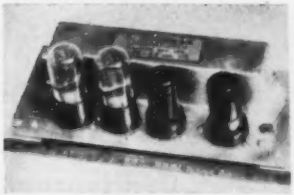
Our apparatus are used by many government agencies, commercial firms and institutions. Among them are the National Bureau of Standards (frequency dividers) and the Royal Observatory, Denmark. The Royal Observatory, Denmark is using our time standards for both mean time and sidereal time. Our frequency standards are also used in the new teletype high speed multiplex system.

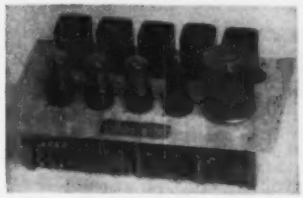
The output frequency of anyone of our units is optional with the customer and many variations may be made without changing the unit to "non-standard". We shall give only one example. Model 52 is most often sold as a 60 cycle unit. If a customer should want the unit with, for instance, 400 cycle output, only three divider stages are required. Then we use the vacant triode section of the second 6SN7GT as an amplier; and by means of a sharply tuned circuit we get a sine wave output. The output impedance and output voltage may also be specified by the customer.

It can be seen from the listing of units that we have two different groups of units. One group Models 52, 54, 56, 58 and 64 (Model 62 might be counted in this group) are suitable to be used as sub-assemblies in case the customer wants to build his own power amplifier and power supply. The other group of units are complete with power outputs and power supplies.

A special group of units are also Models 107, 115 and 117. On account of the superiority of our frequency dividers there has been a demand for these units to be used with the new Western Electric high precision frequency standards and also with other frequency standards.

Model-52

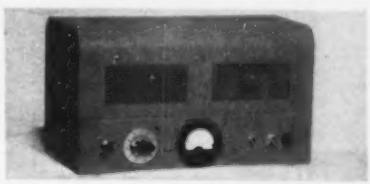




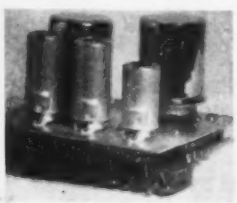
Model-58

Model 52 is our basic unit. It is built on a mounting plate 4⅛ x 9 inches. It is comprised of a quartz crystal, a 6SJ7 crystal drive tube and two 6SN7GT frequency divider tubes. By this arrangement a crystal frequency in the neighborhood of 100 K.C. can be divided down to 50 or 60 cycles. The output from the last oscillator stage is sufficient to drive a pair of 6V6's or similar power output tubes. The wave shape is good enough when, for instance, the object with the amplifier output is to drive a motor or some similar purpose. If a sine wave—or approximate sine wave—output is desired one would have to use Model 54 (picture not shown) which has an output tube and an output transformer. The output from that unit is sufficient to drive almost any type of power amplifier or thyratron inverter. Size of mounting plate 4⅛ x 11½ inches. Models 56 and 58 have the same electrical characteristics as Model 54. The difference in construction is called for by the fact that Model 58 is built to JAN specifications; and Model 58 was approved for a certain application for The Army Air Force. Size of Model 56 is 6⅛ x 12 inches—Model 58 is 4⅛ x 11½ inches.

Model 61 is our smallest standard complete with power supply. Power output 3 watts, 115 volts. Chassis 4½ x 17 inches. Model 62 is the same unit built on a mounting plate 4½ x 17 inches.

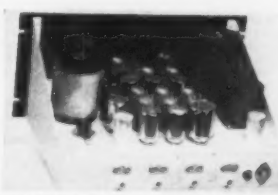


Model 101-6L6 is a 25-watt frequency controlled amplifier for driving small motors and similar applications. Chassis 7 x 14 inches; height with dust cover on 8¾ inches. Weight 25 pounds. Also an excellent portable.

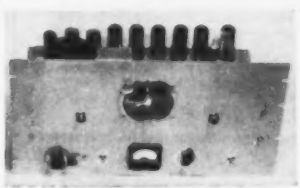


Model 64 is a miniature unit. It is built on a mounting plate 4½ x 4½ inches. It will have approximately the same use as model 52.

Model 105 is a frequency standard complete with power supply. It has sine wave outputs (5 volts across 500 ohms) at 100, 10 and 1 K.C. and also at 100 cycles. It has pulse outputs at the same frequencies. These pulses can be used as such or they can be used to generate harmonics in a radio receiver for frequency comparison. The 100 K.C. harmonics are good to over 100 mega-cycles, the 10 K.C. harmonics to about 30 mega-cycles, and the 1 K.C. harmonics can be heard up to 2 mega-cycles. Frequency stability depends on the customers requirements. It may be within better than one part in ten million when adjusted with WWV at intervals.



Model 103



Model 103F

Model 103 has a clock that is in continuous operation and independent of the power amplifier. The power amplifier can be switched on or off according to need; and the output voltage can be varied from zero to 115 volts. The output power is 25 watts. There is also an independent 500 ohm output (about 8 volts CT) and three high impedance outputs between 15000 and 400 cycles. This unit can be supplied stable within a few parts in ten million. Model 103 also available in standard 19 inch panel—Model 103F.

Model 119 is similar to model 101-6L6 and is built on a chassis 6 x 14 inches; height—7¼ inch. Weight about 18 pounds. Maximum output 10 watts. Was designed to operate at open circuit output, one type B-4 or two type B-4 motors without any adjustments of the volume control. The unit will easily run a ten watt motor such as is frequently used in facsimile transmitters. It is an excellent portable.

Model 35L6 is similar in construction to Model 103 but it operates from 220—240 volts D.C. Output 10 watts.

Model 25L6-IN is also similar to Model 103 but it is built to operate from 115 volts D.C. Output 10 watts. Output tubes 2050 thyratrons. These two units have not got the 500 ohm output or the high impedance outputs unless it is so specified in order.

Model 200-IN is a frequency controlled inverter having 200 watts output. For its operation 115 volts A.C. is required for the control and filament circuits and 230 volts D.C. for the plate of the thyratrons. The 230 volts D.C. can be supplied by a separate rectifier (R-1).

Model 107 is a frequency divider that is suitable for division from 100 K.C. to 10 cycles. Specifications on request.

Model 117 is a frequency divider also suitable for division from 100 K.C. Any type of crystal or frequency standard that has an output from 0.5 to 20 volts can be used with this unit. There are sine wave outputs at 100000, 10000, 1000, 500, 200, 100 and 60 cycles. About 8 amperes 6 volts for the filaments and 50 M.A. (D.C.) at 250 volts must be supplied.

Model 115 is a more elaborate frequency divider that divides 100 K.C. to 20 kc., 5kc, 1 kc, 500 c, 300 c, 250 c, 200 c, 100 c, 50 c and 10 c. A sine wave amplifier and power supply (Model 115A and 115B will also be available.)

We shall be glad to furnish catalog or further information upon request.

ERNST NORRMAN *Laboratories*

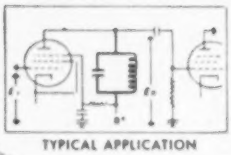
Williams Bay, Wisconsin

TOROIDAL COMPONENTS

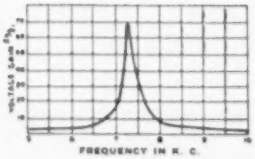
PRECISION TUNED CIRCUITS FOR YOUR SELECTIVE AMPLIFIER

ACTUAL SIZE

High Q precision tuned resonant circuits, accurately adjusted to your specified frequency. Toroid coil and capacitor are permanently protected by tough thermosetting plastic. Pigtail leads and light weight allow direct or terminal board mounting.

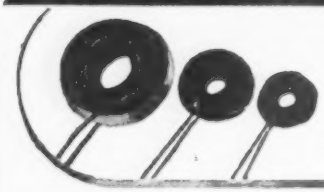


TYPICAL APPLICATION



FREQUENCY IN K. C.

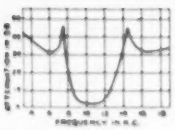
CUSTOM MADE TOROID COILS



Toroid coils, transformers and discriminators in a large range of inductances, frequencies and power levels. Permalloy dust cores. Uncased, mounted in hermetically sealed cans or coated with thermosetting plastic. Close tolerances with taps at any point. Multiple windings. Up to 2 Henries on wedding ring size. Larger sizes to 50 Henries.

MINIATURE TOROID FILTERS

1⅛" x 1⅛"
x 2" HIGH



Specialized design and complete production facilities for your filter requirements. Where space is critical, miniature filters with wedding ring toroids and special capacitors. Supplied in standard units, or designed to your specification. A miniature band pass filter and curve are shown.

RAPID PRODUCTION DELIVERY. Engineering requirements given special attention. Wire, phone or write complete specifications.

COMMUNICATION ACCESSORIES Company

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RAHM Oscillograph RECORDS . . .

instantly, accurately, for immediate analysis!

Specifications:
1-2-4 or 6 CHANNELS
Sensitivity:
3 volts/mm
0.9 ma/mm
Freq. Response:
Flat, 0-70 cps.
Down ½ at 140 cps.

- IT'S NEATER! Noink required . . . no pens to clean. Records dry on non-blurring, heat sensitive DURATAPE. It's handier! Controls easily accessible. Paper supply always visible . . .
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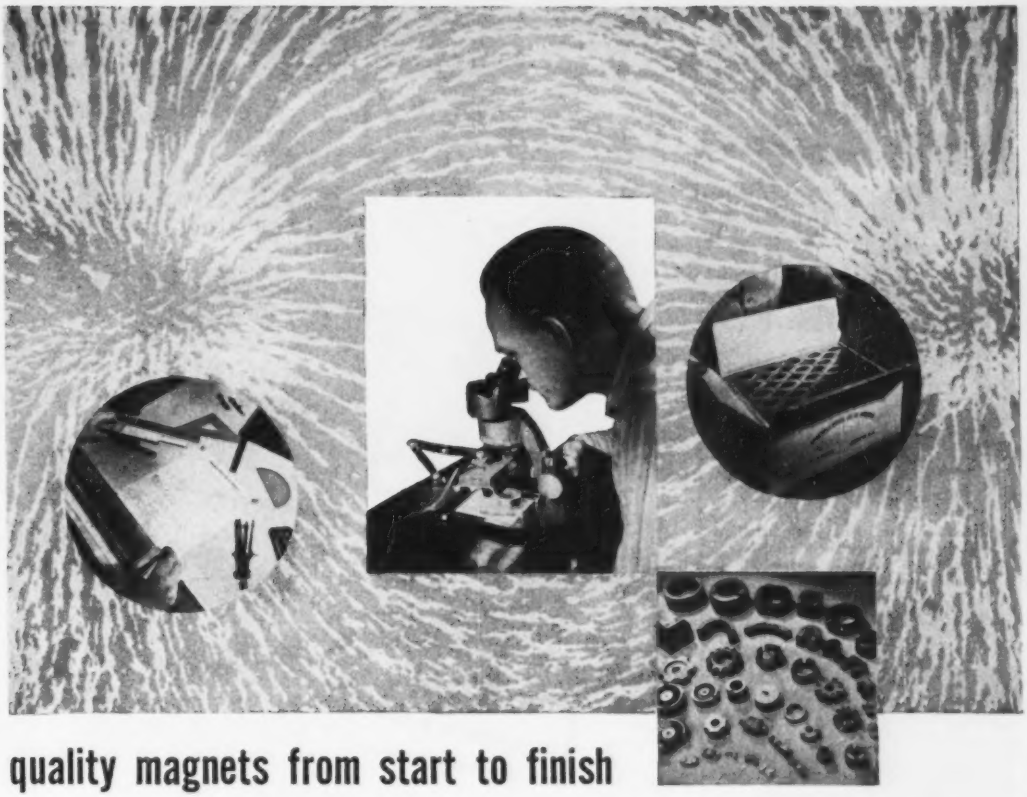
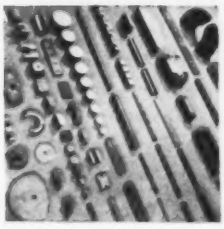


quality magnets from start to finish



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Crucible Alnico Magnets are serving successfully in thousands of varied applications. The experience of Crucible's alert staff of metallurgists and engineers is freely available to you. Take advantage of Crucible's half century of specialty steel leadership. When you think of permanent magnets . . . call Crucible. CRUCIBLE STEEL COMPANY OF AMERICA, Chrysler Building, New York 17, N. Y.

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STAINLESS • HIGH SPEED • TOOL • ALLOY • MACHINERY • SPECIAL PURPOSE • STEELS

The New STAVER
MINI-SHIELD
PATENT AND TRADE MARK REG. PEND.

The shield that fits all Miniature Tubes

A flexible shield that snugly fits all miniature tubes because it compensates for all variations in tube dimensions. Mini-Shields are made for both T5½ and T6½ bulb tubes. Send for catalog sheet.

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A quality Tube Guard that is Bargain Priced

Gives support two ways—Keeps pressure downward and gives sideway support. The spring action is constant and resilient permanently. Send for catalog sheet.

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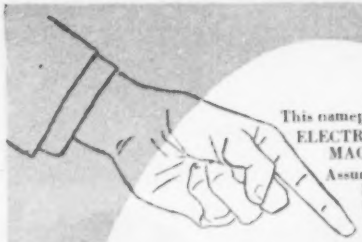
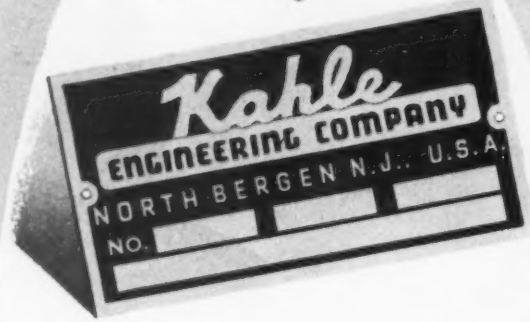


This nameplate on your ELECTRON TUBE MACHINERY Assures Engineering Perfection and Production Profits



THE Kahle NAMEPLATE

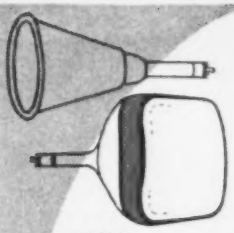
The KAHLE nameplate —our seal of approval— your assurance of trouble-free operation — is only attached to a machine after it has successfully passed exhaustive tests in our own plant. It signifies custom-built machinery, designed and engineered to do a specialized job with the utmost efficiency—whether it's the manufacture of big 30" TV or subminiature tubes—for laboratory or super-speed output.

If your objective is to cut costs and increase productivity, you will find that KAHLE meets all your requirements.

Complete equipment for the manufacture of:

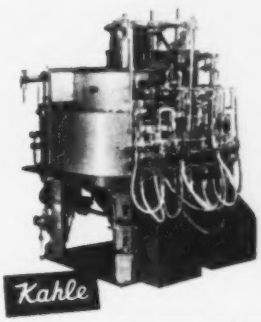
- Cathode Ray Tube (Rectangular and Color, Glass and Metal)
- Standard, Miniature, Subminiature Radio Tubes
- Fluorescent and Incandescent Lamps
- Photocells
- X-ray Tubes
- Vacuum (Thermos) Bottles
- Glass Products

Some examples of Kahle equipment for cathode ray tube manufacturing



#1414
Cathode Ray Tube Button Stem Machine

Custom-built to any requirements, turns out 400-500 TV stems per hour—provides fine adjustment of speed, pressure, heat and sequence of operations—with labor-saving development for automatic tubulation flaring.

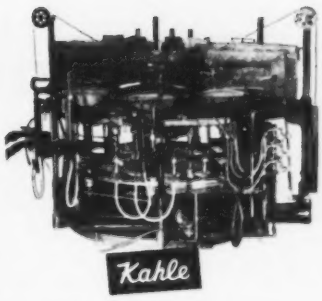


#1540
Single Head Automatic Neck Sealing Machine

For sealing necks to metal cones of metal cathode ray tubes. Operator loads, presses start button. All other operations automatic. Capacity 12 per hr. Also available as eight-head automatic machine.

FACE PLATE SEALING

For sealing glass face plates to metal cones of metal cathode ray tubes.

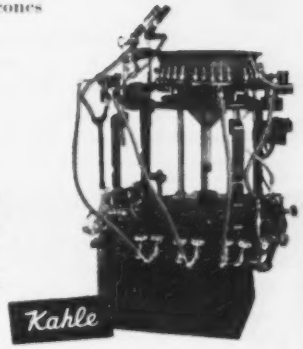


#1578
Eight-Head Automatitc

Manual loading, unloading. All other operations automatic. Kahle Standard Barrel Cam Index, timer controlled. Dual motor drive. Capacity, 60-90 per hr.

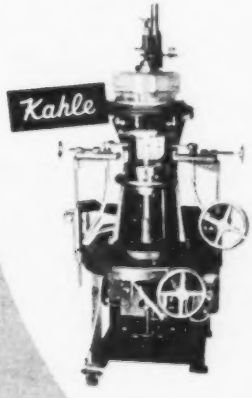
#1534
Single Head Automatic

Operations are automatic. Manual loading, unloading, and maintaining inside air pressure.



SALVAGE OPERATIONS

Metal or Glass



#1545
Neck Splicing Machine

For all types and sizes of cathode ray tubes. Used in salvage, operations-bulb making.

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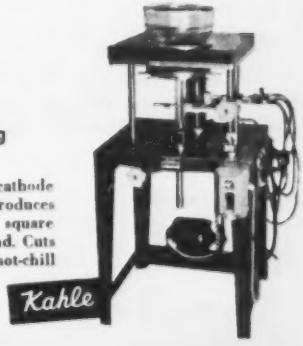
For salvaging cathode ray tubes. Produces perfect, clean square cuts. Single head. Cuts off necks by hot-chill technique. Takes all standard sizes of bulbs and necks.



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  Styles 811 & 821
- **FEED-THRU CERAMICON®**
  Styles 362 & others
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MV-17B DC Millivoltmeter: 1 mV full scale to 1000 V. 6-60 megohms input impedance

MV-171 DC Micromicro-Amps: 165 x 10-12 A to 10 A. (Shunt Box used with MV-17B)

MV-18B RF Millivoltmeter: 1 mV to 1000 V. 1 MC to 200 MC Flat, useful to 2,500 MC.

DCA-3 DC Amplifier and Meter: Same sensitivity as MV-17B.

MV-73B: Most complete multi-purpose meter, DC, AC, RF mVs, AC, DC microamperes, ohms.

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Laminated PLASTIC

SHEETS • RODS • TUBES • SPECIAL SHAPES

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The perfect Insulation Material for high and low voltage applications

Phenolite, laminated plastic, has low moisture absorption, is light in weight, with high impact strength, excellent machinability and one of the strongest materials per unit weight known.

JOINT ARMY-NAVY SPECIFICATIONS

Type		CORRESPONDING PHENOLITE GRADE		
JAN or MIL Numbers	17P5 or 17P25 No.	Sheet JAN-P-13 (Army 61-15) (Navy 17P5) MIL-P-997 (Ships)	Molded Tubing-Tm and Rod-R (Army 72-80) (Navy 17P5) JAN-P-79	Rolled Tubing-Tr (Army 72-80) (Navy 17P5) JAN-P-79
LTS-M-1	PBM	A-701	A-85	.....
M-1	....	X-101, X-109	X-12*	X-3, XX-21-H§
M-3	FBI	LE-651-K	LE-76-B	LE-63
M-4	FBM	C-551*, C-509, C-501†	C-45	C-42
MH-1	FBH	AA-761-N	AA-87	.....
E-1	PBP	XP-214-B, XP-264-B	.....	.....
E-2	PBG	XX-301	XX-26	XX-22-A, XX-22, XX-21-H§
E-3	....	XXP-209-G, 259-G	.....	.....
E-4	PBE	XXX-401	XXX-36	.....
E-5	....	XXXP-219-E, XXXP-455	.....	.....
E-6	....	N-850	.....	.....
EM-1	FBG	CE-552	CE-57	C-42
EM-2	FBE	CE-563-N, LE-659	LE-79	LE-63
EM-3	....	CE-559, CE-568-A	CE-52-D	.....
GMG	GMG	MGB-811	MGB-92, MGB-92-A	MGB-96, MGB-96-A
GSG	....	G-7-830	.....	G-7-97

* Less than 1" thick. † 1" thick and over. * Not made in rod form. § Small diameter rolled tubes .093" to .312" I.D., 1/16" maximum wall thickness.

FEDERAL SPEC. HHP-256 AND ASTM SPEC. D-709

Federal and ASTM Grade		CORRESPONDING PHENOLITE GRADE		
		Sheet	Molded Tubing and Rod	Rolled Tubing
Type I	X	X-109-A	X-11	X-2, XX-21-H
	P	XP-208-E, XP-258-E, XP-214-B, XP-264-B	.....	.....
	XX	XX-301	XX-25	XX-21, XX-21-A, XX-21-H, XX-24
	XXP	XXP-209-G, 259-G	.....	.....
	XXX	XXX-401	XXX-36	.....
Type II	XXXP	XXXP-219-C, XXXP-455	.....	.....
	C	C-501, 509, 551	C-45	C-42
	CE	CE-552	CE-54, 57	C-42
	L	L-651	L-71	.....
	LE	LE-659	LE-79	LE-63
Type IV	A	A-701	A-85	.....
	AA	AA-761-A	AA-87	.....
	G-1	GB-801	.....	.....
	G-3	G-3-820	.....	G-3-98-A
	G-5	MGB-811	MGB-92, MGB-92-A	MGB-96, MGB-96-A
	G-7	G-7-830	.....	G-7-97

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HORNET Transformers provide minimum size, maximum efficiency and greatest life expectancy in transformers for portable and airborne equipment.

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PLATE TRANSFORMER: Primary 115V., 380/1600cps. Secondary 860V. C.T. 70 MA RMS, 60 V.A. (85 deg C. ambient, 50,000 ft. alt.)

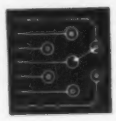
	Max. Oper Temp. Deg C.	Volume Cu. Ins.	Relative Volume Percent	Weight Pounds	Relative Weight Percent
Hermetically Sealed (Class A insulation)	105	21.3	100	2.0	100
Open Construction (Class A insulation)	105	11.0	54.2	1.2	60
HORNET (Class H insulation)	200	6.5	30.5	.33	16.5

The HORNET represents a combination of ingenious design, modern materials, and radically different manufacturing techniques which opens vast new fields in transformer construction and application.

Send for your copy of Bulletin B-300, containing detailed size, weight and rating information on Hornet Transformers and Reactors.

NEW YORK TRANSFORMER CO., INC.
ALPHA, NEW JERSEY

Cut-A-Way view Model 74



Single lines mean complete coaxial circuits

Solid lines indicate position 1. Dotted lines indicate position 2.

COAXWITCH

The Selector Switch for Coaxial Circuits

These are 50 ohm switches, designed for use in coaxial circuits. Characteristic impedance is maintained thru all internal details of the switch and LOW STANDING WAVE RATIOS realized. Switch is comparable in VSWR with the cable and connectors with which it is used.

USES—As a channel selector in transmitter or receiver controls—production line testing of coaxial circuited equipment such as TV receivers—selection of antennas with phase monitors in directionals—intra-equipment switching in coax. links, etc.—with Model 72-2, double ended selection of insertion devices, filters, etc.

CABLE TYPES AND CONNECTORS—Three standard models now available for use with 50-52 ohm cable and Type "N" Fittings. Adaptors and special versions for use with other connectors are available. Other impedance levels, such as 70/75 ohm can be supplied.

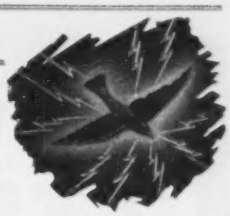
STANDING WAVE RATIOS—at 550 mc. VSWR is below 1.03. At 1000 mc. below 1.1. At 3000 mc. VSWR is not over 1.3.

MODELS—Model 74 handles single circuit with choice of six channels. Model 72-2 handles double circuit with choice of two channels (DPDT). Model 718 handles single circuit with choice of eight channels.

BIRD ELECTRONIC CORP.

BIRD INSTRUMENTATION FOR COAXIAL TRANSMISSION

REMOTELY OPERATED COAXWITCH



This 50 ohm switch is designed for remote switching of coaxial circuits. It will meet rigid Air Force and Navy specifications for operation under extreme environmental conditions at any frequency up to 11,000 m.c. RG-8/U 50 ohm cable connects directly to the switch in the same manner as to an "N" type R. F. fitting, thereby eliminating insertion V.S.W.R. difficulties caused by connectors, also reducing the weight and space required.

DIMENSIONS

6⅝" overall length (less cable) by 2½" diameter.

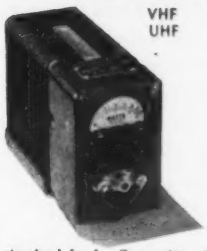
WEIGHT:

2 pounds, 12 ounces approximately.

Model	Circuits	Positions	Operating Voltage
76	Single	6 (Selector)	28V D.C.
75	Single	2 (Relay)	28V D.C.
73	Single	6 (Selector)	Manual

Note: The R. F. portion of manual Model 73 is identical with remote switches.

TERMALINE *Direct-Reading RF Wattmeters* (For use with CW-AM-FM-TV Transmitters)



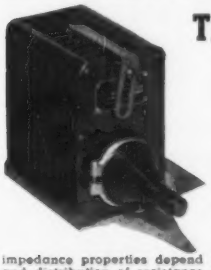
VHF
UHF

Direct-reading instruments for power measurement of transmitters in the 30 to 1000 mc, 1 to 2500 watt group. Accuracy far exceeds any instrument previously available. As simple as use of an ordinary DC voltmeter. Can measure transmitter power, take accurate data on how transmitter power output is affected by line voltage, transmitter temperature rise, time, etc. Gives an accurate standard termination for 50/52 ohm lines, so that comparisons are readily made between antennas and this standard load. Transmitter line and connector losses readily checked to accuracy needed in field work. Determination can be easily made as to how present transmitter performance compares with that realized previously. Results are accurate in absolute terms.

PRINCIPLE—Wattmeter measures power by the E^2/R method. The Termaline resistor (almost a pure resistance over a wide frequency range) dissipates power applied. Dual or triple voltmeter cartridges using the 1N21B crystal diode are bridged across the Termaline resistor input and feed a DC meter with scales direct-reading in terms of RF power.

SPEC.	MODEL 61	MODEL 67	MODEL 67C
FREQUENCY RANGE	30-500 mc or 500-1000 mc	30-500 mc or 500-1000 mc	30-500 mc or 500-1000 mc
POWER RANGE	80 Watts Dual Range 15/60 or 20/80	500 Watts Triple Range 25/100/500W	2500 Watts Water-Cooled Scales to Order
IMPEDANCE	51.5 ohms	51.5 ohms	51.5 ohms
INPUT CONNECTOR	Female "N" Fits UG-21 or UG-21B/U Plug	Supplied with Adapter for UG-21 or UG-21B Other Optional	Fittings For any Standard Rigid or Flexible Coax. Line Available
SCALE TYPE	Expanded At Low Scale Readings	Expanded At Low Scale Readings	Hand-Drawn To Order
ACCURACY	5% of Full Scale	5% of Full Scale	5% of Full Scale
PHYSICAL DIM.	8 x 6 x 4" Wght—10 lbs.	17 x 9 x 6" Wght—30 lbs.	21 x 9 x 6" Wght—40 lbs.

TERMALINE *Coaxial Load Resistors (Dummy Antennas)*



Designed to have a constant input impedance over the frequency range from 0 (DC) to over 4000 mc. Its unique design puts reactance to work and causes it to represent an almost pure resistance, over its frequency range, with NEGLIGIBLE VSWR. The active power dissipating portion is the outer surface of a cylindrical film type resistor, which forms the center conductor of a special self-terminated coaxial structure. Constant impedance properties depend upon shape of coaxial assembly and distribution of resistance along length of outer surface of resistor.

Major application has been as a dummy load for CW, AM, FM and TV transmitters. Being non-radiating, adjustment of transmitters can be made without violation of FCC rulings. A special version of the Termaline resistor is now being incorporated in television transmitters for test purposes. It has proven highly useful as a termination for connectors being investigated for insertion VSWR properties, and for insertion loss measurements on filters, cables, etc.

VSWR—Typical VSWR's taken on production units of Model 81 and 81B—

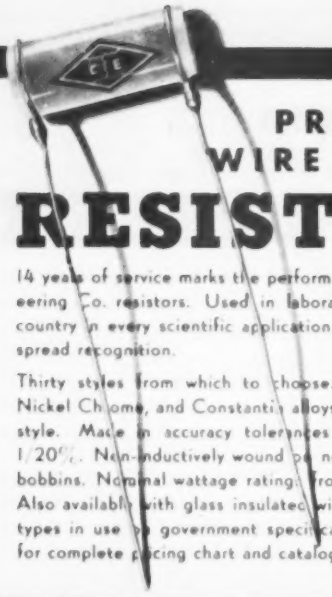
AT	VSWR	AT	VSWR	AT	VSWR
130 mc	1.02	700 mc	1.042	1400 mc	1.075
230 mc	1.02	800 mc	1.015	1500 mc	1.09
300 mc	1.03	900 mc	1.031	1700 mc	1.085
400 mc	1.048	1000 mc	1.046	1800 mc	1.03
500 mc	1.048	1100 mc	1.02	2000 mc	1.057
600 mc	1.024	1200 mc	1.037	3000 mc	1.114

IMPEDANCE—51.5 OHMS

SPEC.	MODEL 81	MODEL 81B	MODEL 82	MODEL 82C
POWER RATING	50 Watts Continuous	80 Watts Continuous	500 Watts Continuous	2500 Watts Water-Cooled
VSWR LESS THAN	1.15 to 4000 mc	1.15 to 4000 mc	1.2 to 2700 mc	1.2 to 2700 mc
FITTINGS	Type "N" Takes UG-21/U or UG-21B/U Plug	Type "N" Takes UG-21/U or UG-21B/U Plug	Supplied With CA-8 Adaptor for UG-21/U Other Optional	OPTIONAL Cable Type Being Used Should Be Specified

BIRD ELECTRONIC CORP. 1800 E. 38th St. CLEVELAND 14, OHIO

West Coast: NEELY ENTERPRISES, 7422 MELROSE BLVD., HOLLYWOOD 46, CAL.



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WIRE WOUND
RESISTORS

14 years of service marks the performance of Cinema Engineering Co. resistors. Used in laboratories throughout the country in every scientific application they are gaining wide spread recognition.

Thirty styles from which to choose. Manganin, Evanohm, Nickel Chrome, and Constantin alloys are available in every style. Made in accuracy tolerances of 1% (standard) to 1/20%. Non-inductively wound on non-hygroscopic ceramic bobbins. Nominal wattage ratings from 1/4 watt to 2 watts. Also available with glass insulated wire up to 10 watts. All types in use on government specification equipment. Send for complete pricing chart and catalogue 11Ax.

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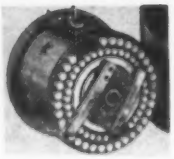
Audio Frequency Attenuators



Cinema Controls are made to the highest degree of accuracy and have years of built-in service. Wiper blades and contacts are hand lapped and matched. Precision types from 1 10 db. Over 500 models. Write for catalogue 11Ax.

PRECISION
Instrument Type Rotary Tap Switches

Using the same fine precision construction of Cinema attenuators these switches are built for dependability. Tailored to your custom requirements. Brass, Nickel Silver, and Coin Silver contacts. Write us giving your requirements.

Audio Supplies

A complete line of laboratory supplies is made as a part of the Cinema line. Patch plugs, jacks, relay racks, decade boxes are but a few of the many items. Plug-in Amplifiers, and Transformers are available in many types. Write for catalogue 11Ax.

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Magnecorders

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50 to 15,000 cps ± 2 db at 15"/sec. tape speed. Signal-to-noise ratio—50 db. Maximum flutter—0.3%. Harmonic distortion—2%. Broadcast quality!

FIRST FOR FLEXIBILITY

Exclusive Magnecord unit construction lets you use Magnecord recorders, amplifiers, and other units interchangeably for portable, rack, or console—add other units at will—record from one to four microphones.

FIRST FOR FEATURES

Now 3 separate heads permit monitoring from tape. Three speeds: 15, 7½, 3¾ inches per second. Up to one hour on 7" NAB reels—will take 10½" reels on portable, too. New POSITIVE TIMING DRIVE. Can be remotely controlled.

THERE'S A MAGNECORDER FOR EVERY PURPOSE . . . . . EVERY PURSE

See the PT6-A portable — only $278. World's most widely used professional tape recorder.

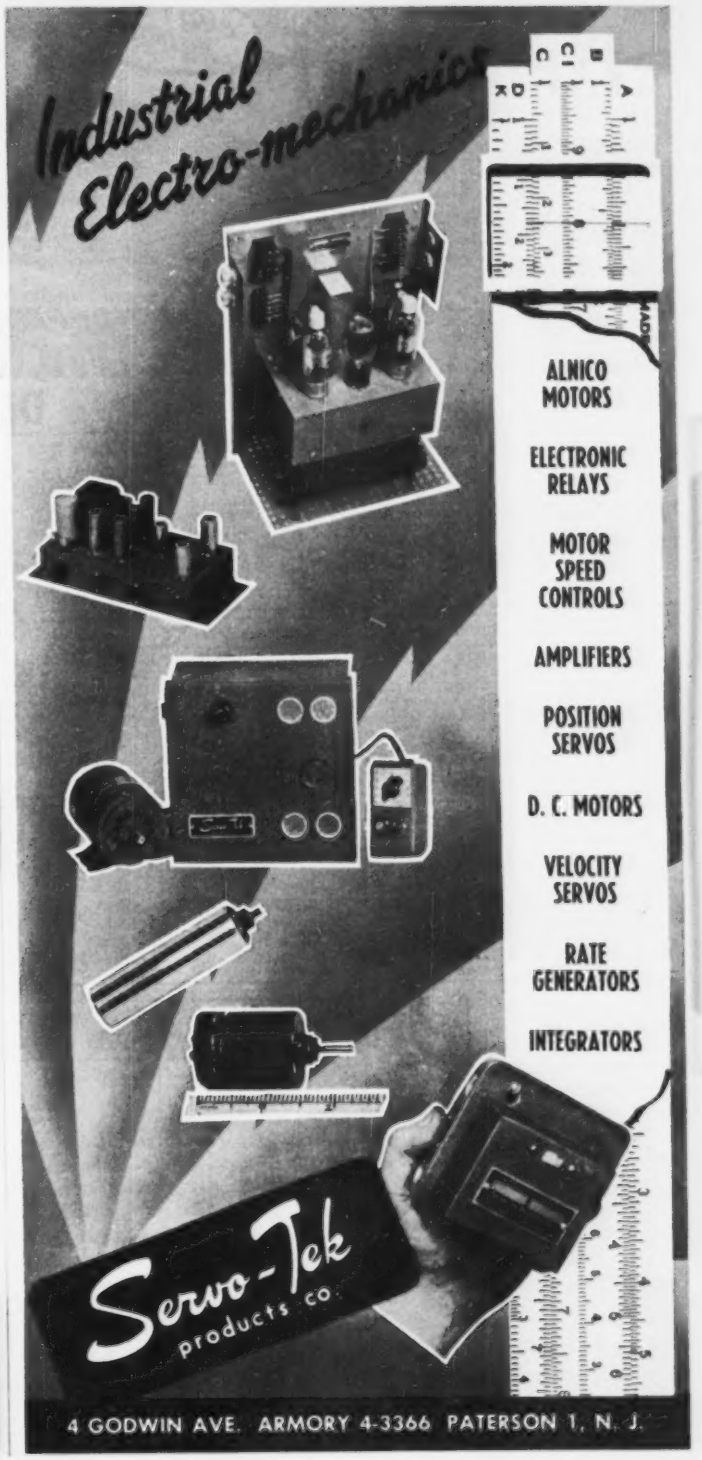
PT7, PT63, and PT6 also rack mount.

PT7 Console — $950 complete

See your distributor or write for specifications on PT6, PT63, and PT7 series Magnecorders.

Magnecord INC.

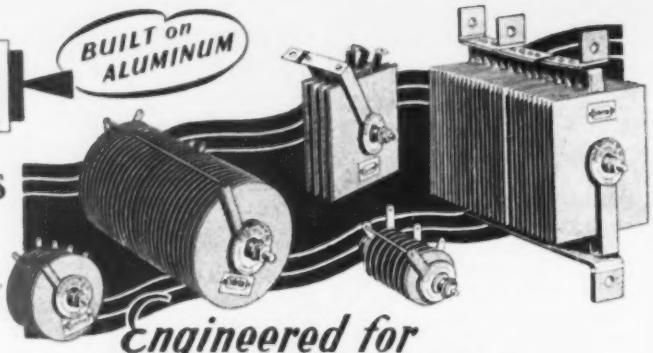
360 North Michigan Avenue
Chicago 1, Illinois



Seletron

SELENIUM RECTIFIERS

BUILT on ALUMINUM



SELETRON Selenium Rectifiers are finding use in wider and wider fields of application ranging from half wave stacks for bias supply, to multiple assemblies capable of delivering many kilowatts. Typical examples of such SELETRON power use are installations operating elevators in more than fifty office buildings in New York and Chicago, an assembly of 48 volts and 10,000 amperes for electrolysis of water, and the spectacular Eveready searchlight on New York's Great White Way.

Engineered for HIGH EFFICIENCY AND DEPENDABILITY

Approx. D.C. Volts	Max. A.C. Input	.15 Amps. D.C. Code No.	.15 Amps. D.C. Length	.22 Amps. D.C. Code No.	.22 Amps. D.C. Length	.30 Amps. D.C. Code No.	.30 Amps. D.C. Length	.45 Amps. D.C. Code No.	.45 Amps. D.C. Length	.60 Amps. D.C. Code No.	.60 Amps. D.C. Length
21	26	M1B1S1C	1 1/4	M1B1S1C	1 1/4	P1B1S1C	1 1/4	P1B1S1C	1 1/4	Q1B1S1C	1
42	52	M2B1S1C	2 1/8	WM2S1S1C	2 1/8	P2B1S1C	2 1/8	WP2B1S1C	2 1/8	Q2B1S1C	2 1/8
63	75	M3B1S1C	2 1/8	WM3B1S1C	3 1/8	P3B1S1C	3	WP3B1S1C	3 1/8	Q3B1S1C	3
84	104	M4B1S1C	3 1/8	WM4B1S1C	4 1/8	P4B1S1C	3 1/8	WP4B1S1C	4 1/8	Q4B1S1C	3 1/8
105	130	M5B1S1C	3 1/8	WM5B1S1C	5	P5B1S1C	4 1/8	WP5B1S1C	5 1/8	Q5B1S1C	4 1/8

Approx. D.C. Volts	Max. A.C. Input	.90 Amps. D.C. Code No.	.90 Amps. D.C. Length	1.2 Amps. D.C. Code No.	1.2 Amps. D.C. Length	1.6 Amps. D.C. Code No.	1.6 Amps. D.C. Length	2.4 Amps. D.C. Code No.	2.4 Amps. D.C. Length	3.1 Amps. D.C. Code No.	3.1 Amps. D.C. Length
21	26	Q1B1S1C	1 1/8	D1B1S1C	2 1/8	D1B1S1C	2 1/8	E1B1S1C	2 1/8	E1B1S1C	2 1/8
42	52	WQ2B1S1C	2 1/8	D2B1S1C	3 1/8	WD2B1S1C	4 1/8	E2B1S1C	3 1/8	WE2B1S1C	4 1/8
63	78	WQ3B1S1C	3 1/8	D3B1S1C	5	WD3B1S1C	6 1/8	E3B1S1C	5	WE3B1S1C	6 1/8
84	104	WQ4B1S1C	4 1/8	D4B1S1C	6 1/8	WD4B1S1C	8 1/8	E4B1S1C	6 1/8	WE4B1S1C	8 1/8
105	130	WQ5B1S1C	5 1/8	D5B1S1C	7 1/8	WD5B1S1C	9 1/8	E5B1S1C	7 1/8	WE5B1S1C	9 1/8

Approx. D.C. Volts	Max. A.C. Input	4.0 Amps. D.C. Code No.	4.0 Amps. D.C. Length	5.2 Amps. D.C. Code No.	5.2 Amps. D.C. Length	6.0 Amps. D.C. Code No.	6.0 Amps. D.C. Length	8.0 Amps. D.C. Code No.	8.0 Amps. D.C. Length	10 Amps. D.C. Code No.	10 Amps. D.C. Length
21	26	F1B1S1C	2 1/8	F1B1S1C	2 1/8	G1B1S1C	3	H1B1S1C	3	H1B1S1C	3
41	52	F2B1S1C	3	WF2B1S1C	4 1/8	G2B1S1C	4 1/8	H2B1S1C	4 1/8	WH2B1S1C	5 1/16
62	78	F3B1S1C	5	WF3B1S1C	6 1/8	G3B1S1C	6 1/8	H3B1S1C	6 1/8	WH3B1S1C	7 1/8
83	104	F4B1S1C	6 1/8	WF4B1S1C	8 1/8	G4B1S1C	8 1/8	H4B1S1C	8 1/8	WH4B1S1C	10 1/8
104	130	F5B1S1C	7 1/8	WF5B1S1C	9 1/8	G5B1S1C	9 1/8	H5B1S1C	9 1/8	WH5B1S1C	12 1/8

Seletron

MINIATURES
For RADIO and TELEVISION
Applications

MODEL NO.	PLATE SIZE	STACK THICKNESS	MAX. INPUT VOLTAGE R.M.S.	MAX. PEAK INVERSE VOLTAGE	MAX. D.C. OUTPUT CURRENT
1M1	1" sq.	1/2"	95	75	100 MA
8Y1	1" sq.	1/2"	130	380	20 MA
16Y1	1" sq.	1"	260	760	20 MA
5M4	1" sq.	1/2"	130	380	75 MA
5M1	1" sq.	1/2"	130	380	100 MA
5P1	1" sq.	1/2"	130	380	150 MA
6P2	1" sq.	1"	156	456	150 MA
5R1	1" x 1 1/4"	1/2"	130	380	200 MA
5Q1	1" sq.	1/2"	130	380	250 MA
6Q1	1" sq.	1"	156	456	250 MA
6Q2	1" sq.	1"	156	456	250 MA
5QS1	1" x 2"	1/2"	130	380	350 MA
6QS2	1" x 2"	1"	156	456	350 MA
5S1	2" sq.	1/2"	130	380	500 MA
6S2	2" sq.	1"	156	456	500 MA

Listed above are full wave bridge rectifiers. Ratings are for continuous duty, resistive inductive load, in an ambient temperature of 55° C.

For higher voltages and currents other combinations are available. The tabulations shown are only a partial listing. Send us specifications for other designs . . . Our engineers will be glad to aid you in the solution of your rectifier problems without obligation. For booklet on SELETRON Selenium Rectifiers, write Dept. BS-3.

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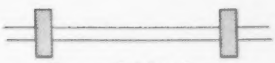
(Illustrations are actual size)

Typical Applications

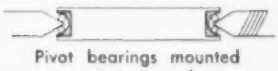


Two radial bearings supporting shaft.

Shaft with radial bearing and pivot bearing.

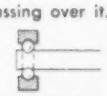
Radial bearings used to make a roller.

Shaft with pivot-bearings at both ends.



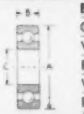
Pivot bearings mounted in rotating member; shaft stationery.

Radial Bearing with groove used as a guide for wire or thread passing over it.



Radial bearing with shaft as inner race; for cam followers.

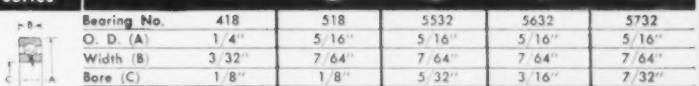
radial series



Bearing No.	2	2½	3	4	5
O. D. (A)	1/8"	5/32"	3/16"	1/4"	5/16"
Width (B)	3/64"	1/16"	5/64"	3/32"	7/64"
Bore (C)	1/25"	3/64"	.0550	5/64"	3/32"
Weight (grams)	.035	.085	.15	.33	.69
Rating 1000 rpm	1.8 lbs.	2.4 lbs.	4.8 lbs.	9.0 lbs.	10.0 lbs.

TOLERANCES (A) +.0000" −.0002" (B) +.000" −.001" (C) +.0000" −.0002"

super light series



Bearing No.	418	518	5532	5632	5732
O. D. (A)	1/4"	5/16"	5/16"	5/16"	5/16"
Width (B)	3/32"	7/64"	7/64"	7/64"	7/64"
Bore (C)	1/8"	5/32"	3/16"	7/32"	
Weight (grams)	.28	.625	.56	.43	.36
Rating 1000 rpm	5.6 lbs.	6.3 lbs.	5.6 lbs.	5.6 lbs.	3.8 lbs.

TOLERANCES SAME AS STANDARD RADIAL SERIES

pivot series

Bearing No.	2P	3P	4P	5P	7½P	10P
O. D. (A)	2mm.	3mm.	4mm.	5mm.	7.5mm.	10mm.
Width (B)	1.2mm.	1.8mm.	2.4mm.	3mm.	4.5mm.	6mm.
Shaft (C) Min.	2/100"	3/100"	4/100"	5/100"	7.5/100"	10/100"
Weight (grams)	.025	.080	.165	.32	1.00	2.56
Rating 1000 rpm	T 29–R 07 lbs.	T 1.1–R 46 lbs.	T 3.1–R 1.2 lbs.	T 5.8–R 2.3 lbs.	T 13–R 5.2 lbs.	T 23.2–R 9.0 lbs.

TOLERANCES (A) +.0000" −.0002" (B) + or −.002"

angular contact series

Bearing No.	2A	3A	4A	6A
O. D. (A)	1/8"	3/16"	1/4"	3/8"
Width (B)	3/64"	7/100"	3/32"	9/64"
Shaft (C) Max.	.032"	.048"	.063"	.094"
Weight (grams)	.053	.17	.425	1.49
Rating 1000 rpm	R 1.4–60 T 1.7 lbs.	R 3.7–60 T 4.7 lbs.	R 6.9–60 T 8.7 lbs.	R 15.5–60 T 19.0 lbs.

TOLERANCES (A) +.0000" −.0002" (B) +.000" −.002"

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• HIGH MEGOHM • HIGH VOLTAGE

STYLE	TYPE	WATTS Max.	VOLTS Max.	DIMENSIONS Length (Inches)	DIMENSIONS Diameter (Inches)	RESISTANCE Min.	RESISTANCE Max. Megohms
WIRE WOUND PRECISION RESISTORS	AFB	0.5	125	15/32	9/16	0.1 Ohm	1
	AGC	0.5	250	5/8	5/8	0.1 Ohm	2
	AGF	1.0	500	1	5/8	0.1 Ohm	4
% Tolerances 1, 1/2, 1/5, 1/10, 1/20	AJS	1.0	500	1-9/32	3/4	0.2 Ohm	5
	ALP	2.0	750	2-1/32	7/8	0.5 Ohm	7.5
HIGH VOLTAGE RESISTORS	BBF	1	3500	1	5/16	.05 Meg.	10,000
	BBM	2	7500	1-3/4	5/16	.10 Meg.	25,000
	BBR	3	15,000	3	5/16	.20 Meg.	25,000
% Tolerances 15, 10, 5, 3 Matched Pairs 2%	BBV	5	30,000	5-1/2	5/16	.40 Meg.	25,000
	BFQ	4	15,000	2-1/2	9/16	.20 Meg.	25,000
	BFT	6	25,000	4	9/16	.40 Meg.	25,000
	BFW	10	40,000	6-1/2	9/16	.70 Meg.	25,000
Type T — 20% Only	DPW	20	35,000	6-1/2	1-1/8	1 Meg.	50,000
	DPX	30	65,000	10-1/2	1-1/8	2 Meg.	50,000
	DVY	50	90,000	14-1/2	1-1/2	4 Meg.	100,000
Type B and T — Lugs Only	DZW	30	40,000	6-1/2	2	3 Meg.	35,000
	DZZ	90	125,000	18-1/2	2	7.5 Meg.	100,000
	TBR	2	15,000	3	5/16	1 Meg.	10
	TFQ	3	20,000	2-1/2	9/16	1 Meg.	10
HIGH MEGOHM RESISTORS	HBF	1	3500	1	11/32	10 Meg.	2 Million
	HBM	2	7500	1-3/4	11/32	10 Meg.	10 Million
	HBR	3	15,000	3	11/32	10 Meg.	50 Million
% Tolerances 10, 5							
HIGH FREQUENCY RESISTORS	FBF	1	500	1	5/16	20 Ohms	100
	FBM	2	1000	1-3/4	5/16	35 Ohms	100
	FBR	3	1700	3	5/16	65 Ohms	100
% Tolerances 15, 10, 5 Type F — Lugs Only	FFQ	4	1400	2-1/2	9/16	30 Ohms	50
	FFT	6	2200	4	9/16	50 Ohms	75
	FFW	10	3700	6-1/2	9/16	75 Ohms	100
Type G — Lugs and Ferrules	GPW	20	3300	6-1/2	1-1/8	35 Ohms	50
	GPX	30	5500	10-1/2	1-1/8	60 Ohms	100
	GVY	50	8000	14-1/2	1-1/2	65 Ohms	100
	GZW	30	3300	6-1/2	2	20 Ohms	25
	GZZ	90	10,000	18-1/2	2	60 Ohms	100

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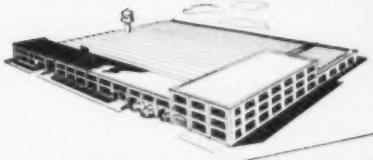

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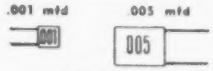

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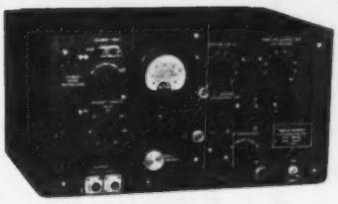

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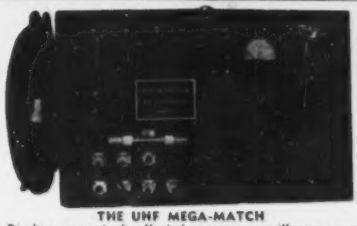

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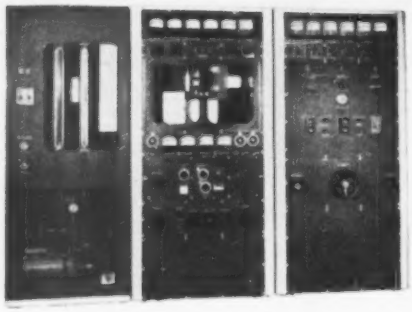

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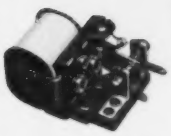

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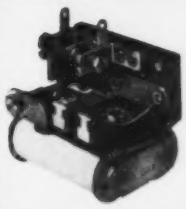

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SPDT SENSITIVE RELAY — A. C. — D. C. — KEYING — featuring low cost and unusual characteristics.

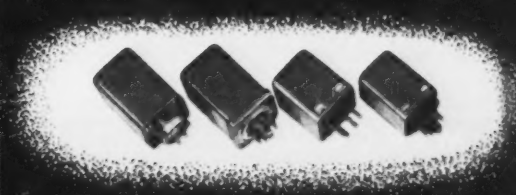
D. C. Sensitivity comparable with Series 4, but less adjustment flexibility. Exceptionally long life rocking pivot and availability of bounce-free contacts (Normally Open only) suit it for high speed counting and keying. Mechanical life over 10^8 operations. Also well suited for any plate circuit use requiring moderate precision and vibration immunity. Contacts can be rated at 5 amps — sometimes more. Coil resistance up to 14000 ohms.

A. C. Sensitivity better than 0.1 V. A. Impedance as high as 130,000 ohms at 90 volts 60 cps. Supplied for frequencies from 16 to 400 cps. Shunt or series coils available. Excellent for protection of delicate thermostat or instrument contacts. Operates over wide range of variable input (e.g. 90-250v A. C.).

AVAILABLE SERVICE

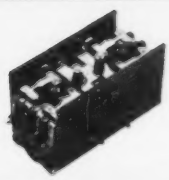
1. Selection from tabulated standards. Several different sensitivities, at a large number of coil resistance levels, in a number of mechanical styles — for each relay type described.
2. Functional study of your problem. Working in our laboratory or yours, we help to determine relay specifications with which your equipment will best function taking account of relay characteristics and limitations both general and particular.

By all means avail yourself of this service when your engineering is in its early stages. Relay dynamics, while simple, are not always obvious. Fitting circuits to relays is often easier than vice versa.



VARIETY OF ENCLOSURES

Some of the standard enclosures (including hermetically sealed) in which Sigma relays are available.



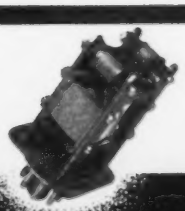
SERIES 6

MULTICIRCUIT POLARIZED SENSITIVE RELAY — with single or double (differential) windings, resistance up to 25000 ohms total, and contacts up to 4PDT, 5 AMP nominal rating. Fully balanced armature strongly resistant to vibration.

Form X — Null Seeking — For automatic positioning or two-way process control. Armature normally held at center by positive detent but operable either right or left by coil power of appropriate polarity and magnitude. Sensitivity depending on contact complexity from 10 to 100 milliwatts.

Form Y — Biased (Spring Return) — For use as an ordinary sensitive relay where a complex contact combination is required. Often combines the function of pilot relay and contactor. Sensitivity range same as Form X. Responsive only to D. C. of proper polarity. Armature returns to normal position when coil power is removed, closing N. C. contacts.

Form Z — Latching (Permanent Magnetic) — As a replacement for mechanical latch electrical reset relays where longer life and greater resistance to vibration is required. When these features are stressed sensitivity is from 100 to 250 milliwatts.



SERIES 7

SPDT SENSITIVE HIGH SPEED POLARIZED RELAY. Single or multiple windings up to 14000 ohms (single). Fully balanced armature. Nominal contact rating 2 amps. Especially designed for repeating telegraphic signals at speeds up to 250 words per minute. Exceptionally free from distortion and chatter, small size and weight, hermetically sealed (cover removed in cut). Mechanical life over 10^8 operations. Life under representative severe telegraphy service 10^7 operations.

Forms X, Y, and Z are available in the Series 7 giving same modes of operation as in the Series 6 above. Sensitivities range from less than 1 to 10 milliwatts depending on form and requirements. The Form X is useful as the detecting element in positioning bridge circuits and the like because of fairly high sensitivity plus the stabilizing advantages of detent centering of the armature in the balanced bridge condition.

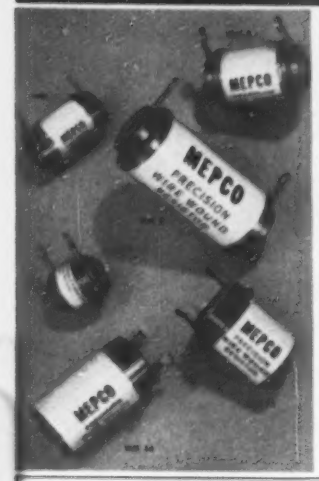
WRITE FOR FULLY DESCRIPTIVE CATALOG

In this space we have highlighted general characteristics of the Sigma line and salient features of individual members. This advertisement may serve as a preface to our general catalog which is yours for the asking. Your specific inquiry on an actual problem will receive prompt attention.

SIGMA Instruments, Inc.
SENSITIVE RELAYS
82A Ceylon St. Boston 21, Mass.

MEPCO PRECISION RESISTORS

JAN-R-93 LUG TERMINAL TYPES



CERAMIC FORMS: Non-hygroscopic material, high dielectric, low coefficient of expansion. No. 6 screw hole through center.

WIRE: Highest grade alloys; Cu-Ni, Ni-Cr, Cu-Mn-Ni, Ni-Cr-Al-Cu, Ni-Cr-Fe, enamel or fabric covered. Minimum size .0015 standard, .0007 special.

TEMPERATURE COEFFICIENT: ± .002%/°C for ohmages up to approx. 2500; .017%/°C above 2500. .002%/°C may be ordered special on any type resistor.

TOLERANCE: ± 1%, ±.5%, ±.25% standard. ±.1, ±.05 special.

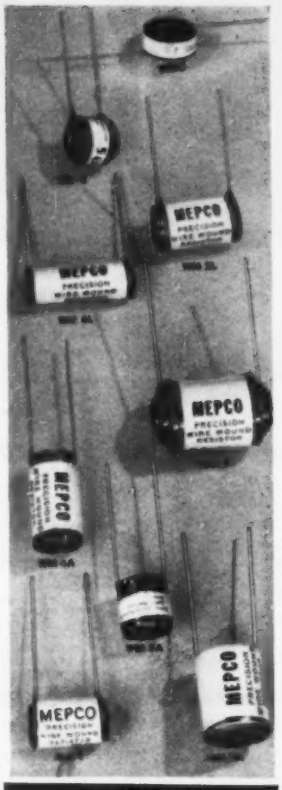
MOISTURE PROTECTION: Standard units thoroughly impregnated with moisture and salt water proofing compounds and fungus resistant acetate label. Vacuum impregnating and other special sealing on request.

INSULATION: Each cross-over wire insulated from winding by acetate cloth. All units receive 500V. breakdown test.

INDUCTANCE: Reversed, balanced winding in each pie section minimizes inductance up to approx 50KC. Special frequency characteristics upon request.

Type		Wattage Rating		Resistance Range			Dimensions (Inches)		* Jan Voltage Ratings		
Jan.	Mepco	Jan.	Commercial	Low (OHM)	High (MEG)	Special* (MEG)	Length	O. D.	1%	.5%	.25%
RB 10	R3 10	1/4	1/2	.1	.2	.5	15/32	1/2	215	186	152
RB 11	WM 3	1/3	1	.1	.2	.4	9/16	9/16	316	274	224
RB 12	WM 4	1/2	1	.1	.6	1.5	1	9/16	387	335	274
RB 13	WM 5	1/2	1	.1	.9	3	1 1/4	3/4	612	520	433
RB 14	WM 2	1	2	1	3	5	2	7/8	2000	1732	1414
RB 21	WM 1	1	1	1.0	5	1	2 1/8	9/16	895	775	632
RB 40	WM 1/2	.4	1	.1	.15	.3	1	3/4	245	212	173
RB 41	WM 13	1/2	1	.1	.3	.6	1 1/4	3/4	387	335	274
RB 42	WM 14	.6	1	.1	.5	1.5	1 3/8	3/4	520	450	367
RB 51	RB 51	1/4	1/2	.1	.1	.3	3/8	3/8	158	137	112

* Higher maximum resistance at reduced power rating using smaller wire sizes.



COMMERCIAL LEAD TERMINAL TYPES

MOLDED ★ lead terminal PRECISION RESISTORS: Positive Connection between Winding and Terminal. Eliminates all soldered joints in resistor. No flux used—all connections non-corrosive. Cannot "OPEN" due to flexing of lead terminals. Same construction as our JAN R-93 Lug terminal types.

★ Terminal and end of winding are imbedded together by the metal molding process, assuring a positive electrical and mechanical connection.

Other lead terminal types are of the same basic construction as Lug Types. Terminals are No. 21 AWG copper wire, tinned, 1½" long. Wire fastened on resistor so it cannot turn or come loose. Wire from winding attached to lead at side opposite terminal to prevent breaking when terminal is flexed.

Type WM-O resistor usually supplied with an inductive winding. Special non-inductive construction on request.

	Type	Wattage Rating	Resistance Range		Dimensions (Inches)	
			Low	High*	Length	O. D.
	WM 1/4	1/20	50 ohms	.03 meg	9/32	1/4†
	WM 1/2	1/10	5 ohms	.05 meg	7/16	1/4†
	WM 0	1/4	1 ohm	.2 meg	1/4	5/8
	WM 2L	1/2	.1 ohm	.1 meg	3/4	3/8
★	ML-3	1	.1 ohm	.2 meg	9/16	9/16
★	ML-4	1	1 ohm	.6 meg	1	9/16
★	ML-5	1	1 ohm	9 meg	1 1/4	3/4
★	ML-2	2	1 ohm	3 meg	2	7/8
	WM 6L	1	.1 ohm	.2 meg	1 3/16	3/8
	WM 3A	1	.1 ohm	.5 meg	1/2	1/2
	WM 4A	1	1 ohm	.9 meg	1	1/2
	WM 5A	1	1 ohm	1 meg	3/4	5/8

† Not illustrated.
* Higher maximum resistance, at reduced power rating, may be had by using smaller wire sizes. Data on request.

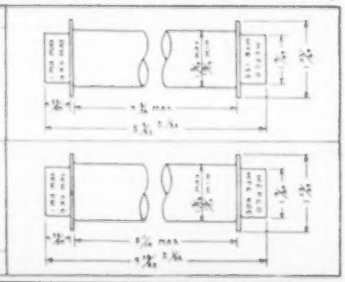
MEPCO METER MULTIPLIER

JAN R-29 TYPES MFA & MFB

HERMETICALLY SEALED: Metal to Steatite. **HIGH STABILITY:** Finest grade Alloy wire—Properly aged. **SHOCK RESISTANT:** Suspended elements—Internal cushioning. **REPLACEABLE SECTIONS:** Eliminates complete loss of unit if damaged. **TEMPERATURE COEFFICIENT:** ±.017%/°C standard, ±.002%/°C special. **TERMINALS:** Nickel plated brass. Fits standard fuse clips.

Type	Megohms†	Kilovolts
MFB 105*	1.0	1.0
MFB 155	1.5	1.5
MFB 205	2.0	2.0
MFB 255	2.5	2.5
MFB 305	3.0	3.0
MFB 355	3.5	3.5
MFA 355*	3.5	3.5
MFA 405	4.0	4.0
MFA 455	4.5	4.5
MFA 505	5.0	5.0
MFA 605	6.0	6.0

*U.S.N. replacement †± 5%



MEPCO, INC. 37 Abbett Avenue, Morristown, N. J.
Telephone: Morristown 4-5777

ACCURATE, DEPENDABLE *Telechron*® MOTORS

for automatic timing, switching, controlling and recording instruments

All Telechron Timing Motors are instantly . . . constantly synchronous. They will start full load and reach synchronous speed instantly and remain in synchronism throughout their life. *Slippage or "drift" is absolutely impossible within rated load.*

INHERENT LONG LIFE

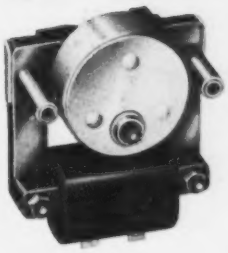
The replaceable, high-speed rotor unit is sealed to keep dust out and lubrication in. The lubricating system keeps all moving parts lubricated for years . . . meters correct amount of oil to the terminal shaft bearing . . . causes the rotor shaft to spin on a film of oil. *No Telechron motor rotor shaft bearing has ever worn out.*

COMPLETE LINE

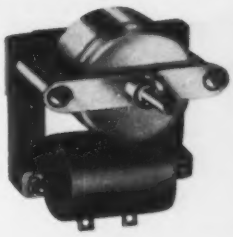
Telechron motors come in many different types, torque ratings and terminal shaft speeds. All Telechron motors are Underwriters' Laboratories approved.

APPLICATION ENGINEERING SERVICE

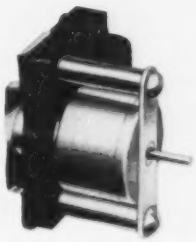
Whatever your requirements . . . standard or special . . . you can get complete satisfaction from Telechron, world's largest producer of synchronous electric timing motors. Here, application engineers offer you the benefits of the longest engineering and manufacturing experience in the field. Address Application Engineering Service, Telechron Inc., 45 Union St., Ashland, Massachusetts. A General Electric Affiliate.



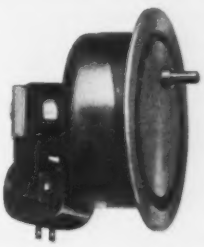
Light-duty motor, type H3
Torque rating .018 pound-inch at 3.6 rpm at 60 cycles 115 volts.



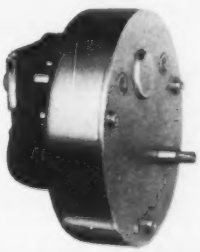
Medium-duty motor, type H5
Torque rating from .20 pound-inch at 6 rph to .50 pound-inch at 1 or 2 rph at 60 cycles 115 volts.



Medium-duty motor, type B
Torque rating of various models from .015 pound-inch at 60 rpm to .375 pound-inch at ½ or 1 rpm at 60 cycles 115 volts.



Heavy-duty motors, C types
Torque ratings of various C types range from .25 pound-inch at 4 rpm to 2 pound-inches at 1 rpm at 60 cycles 115 volts.



Type 1M9 instrument movement
Designed especially for chart drives, but adaptable to most instruments. Terminal shaft speeds from one revolution in 15 minutes to 1 revolution in 30 days. Terminal shaft rotation counter-clockwise.

Telechron®

ALL TELECHRON TIMING MOTORS ARE

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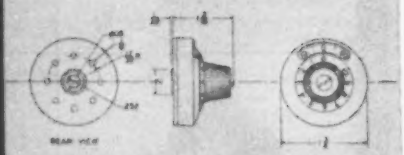
MICRODIAL
TEN TURN-COUNTING DIAL

Microdial is composed of two concentrically mounted dials . . . one for counting increments of each turn and the other for counting turns. The incremental dial has 100 equal divisions and is attached rigidly to the shaft so there is no backlash. Thus the contact position is indicated to an indexed accuracy of 1 part in 1000. Rotation is continuous in either direction. There are no stops on the Microdial assembly.

COMPACT . . . Microdial has same O.D. as Micropot . . . requires no more panel space.

CLEAR READING . . . Forced fast-reading tests showed only 1/20th as many errors with Microdial open window as with next most legible dial. Turn counter distinguishes between 0 and 10 turn readings, and accelerates to avoid confusion on readings near integral turns. Precise readings are made from larger dial with maximum separation of graduations and wide angle visibility.

CONVENIENT . . . delivered completely assembled with dials synchronized. Easily mounted in a few seconds. All dials may be locked.



Microdial . . . turn-counting dial, primarily designed for use on Micropot ten turn linear potentiometer . . . can be used on any multiturn device having ten turns or less.

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. . . newest in ARC's line of Signal Generators

108-118 MC

24 omni courses
Left-center-right phase localizer
Left-center-right 90/150 cps localizer.

Signal source for bench or ramp testing of VHF airborne omnirange and localizer receivers. RF output for ramp checks, 1 volt into 52 ohms; for bench checks, 0-10,000 microvolts. Description and specifications on request.

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23,500-24,500 mc. RF signal source, CW or pulse frequency-modulated. Equal to military TS-223/AP.

TYPE H-12
900-2,100 mc. RF signal source, CW or pulse amplitude-modulated. Equal to military TS-419/U.

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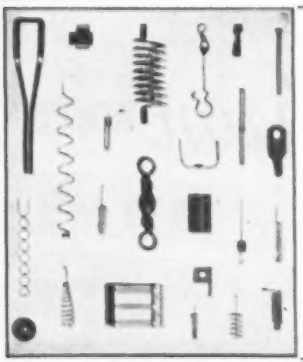

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Filaments, anodes, supports, springs, etc. for electronic tubes. Small wire and flat metal formed parts to your prints for your assemblies. Double pointed pins. Wire straightened and cut diameter up to ¼-inch. Any length up to 12 feet.

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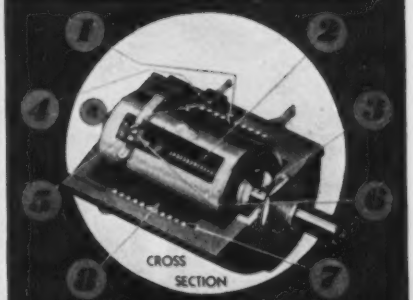
PRECISION TEN-TURN POTENTIOMETER

1. You get permanent accuracy because the resistance wire is locked in place. It is precision positioned and moulded integrally with the housing.
2. You get permanently accurate settings, smooth action and low uniform torque provided by the stainless steel, precision ground, double thread lead screw guiding the moving contact.
3. You get precise positioning of the moving contact because of the two bearings supporting the rotor assembly.
4. You get good rigid terminals because they are moulded integrally with the housing.
5. Terminals soldered to ends of resistance element before moulding. Entire resistance circuit is an integral part of the housing.
6. You get accurate setting and resetting due to anti-backlash spring in contact guide.
7. You get a fine resolution because of the 43½" length of resistance wire in the spiral element.
8. You get a resistance output directly proportional to shaft rotation within ±0.1% of the total resistance. Every potentiometer is automatically machine tested for linearity at 101 points.



LINEARITY ACCURACY ± 0.1%

Units for immediate shipment:
1,000 to 30,000 ohm range.
Special resistance values made to order.

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FOR VISUAL DYNAMIC SIGNAL TRACING

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The VTVM is supplied in individual black steel cases, 9 ⅞" x 14" high, 6" wide, 4¾" deep.

Shipping weight 10½ lbs. complete.

110 - 130 Volts, 50-60 cycles.

FEATURES OF THE VTVM

1. D.C. Ranges: 0 to 3-10-30-100-300 and 1,000 volts. All ranges have a constant input resistance of 11,000,000 ohms. Accuracy 3%±.
2. A.C. Ranges: 0 to 10-30-100-300 and 1,000 volts. Sensitivity: 1,000 ohms per volt. Accuracy 5%±.
3. Ohmmeter Ranges: 0-1,000 ohms, 0-10,000 ohms, 0-100,000 ohms, 0-1 megohm, 0-10 megohms, and 0-1,000 megohms.
4. R. F. Voltage Ranges: 0/3-10-30-50, 50 Volts to be measured on 100 Volt range (using the Ediprobe.)
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FEATURES:
1. Smallest R.F. probe made, ⅝" diameter x 4½" long, low loss lamitex
2. Standard phone plug will fit into D.C. jack of VTVM.
3. Frequency range 60 Cycles to over 100 Megacycles.
4. R.F. Voltage ranges 0/3-10-30-50. 50 Volts to be measured on 100 Volt range.
5. Effective circuit loading: 3 mmf. and 1 megohm.
6. Can be used as an output meter.
7. Can be used for measuring decibles.
8. Tests condensers for open circuits.

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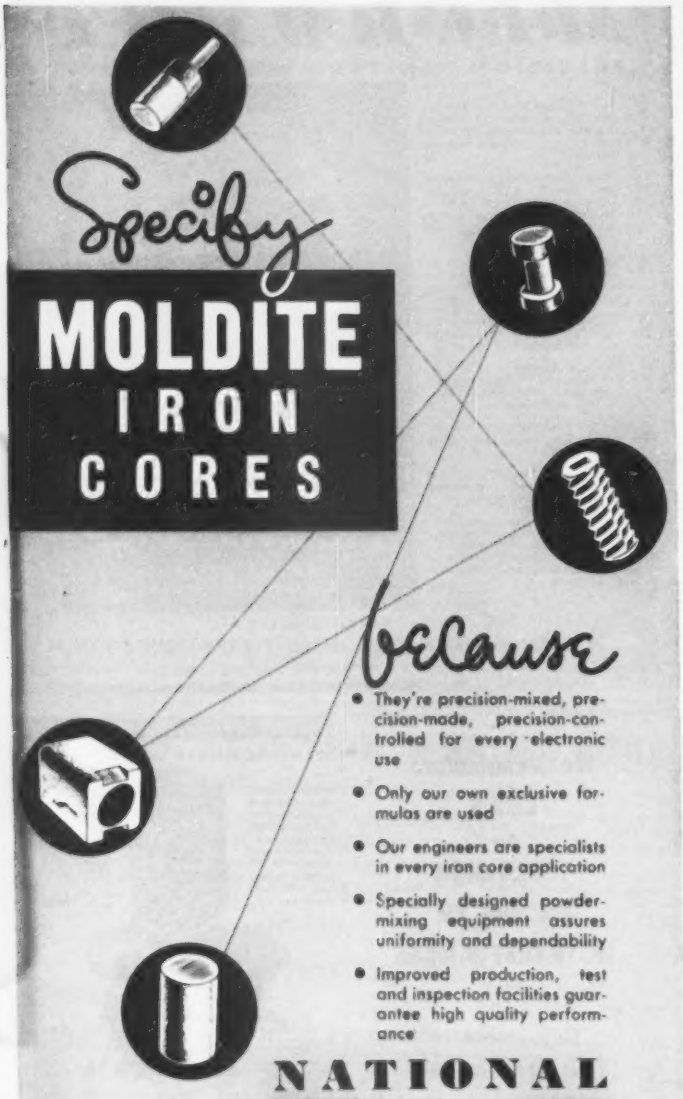
HIGH VOLTAGE PROBE—Model PR-30

Overall range up to 30,000 Volts. Calibrated for Electronic Designs VTVM Model 100. Used in Television Circuits. Experimental High Voltage Applications. Industrial Electronics and for Transmitter Power Supplies. Send for full information.

List Price $14.25

ELECTRONIC DESIGNS, INC., IRVINGTON, NEW YORK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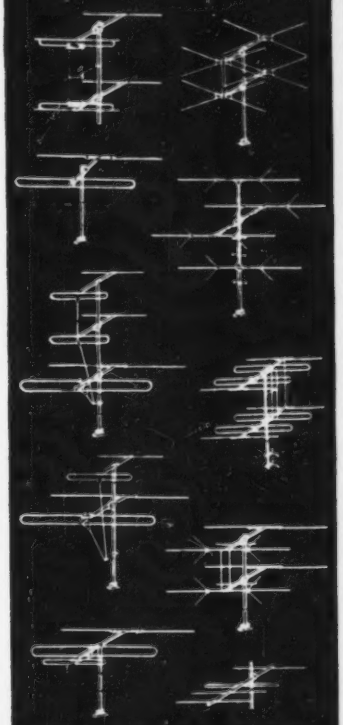
FEATURING

Jiffy-Rig



● For 16 years Technical Appliance Corporation has shown the way for AM, FM, and TV antenna design and development. Unparalleled research facilities along with antenna engineering second to none, assure the leadership of Taco. For a wealth of reliable performance curves, directivity patterns, and general antenna information, be sure to include the Taco catalog in your file. Detailed Engineering Bulletins available. Write for yours today.

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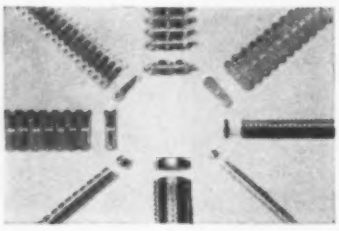
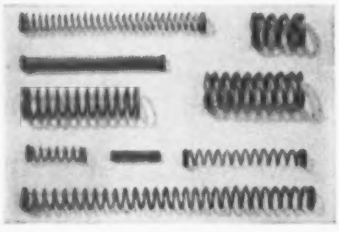
Instrument Specialties Company specializes in the design and custom manufacture of age-hardened alloy springs. With our specially developed processes and machines, our engineers are able to realize the fullest performance potential from the superior spring materials around which I-S service to designers and manufacturers has been developed.

FOR HIGH PRODUCTION





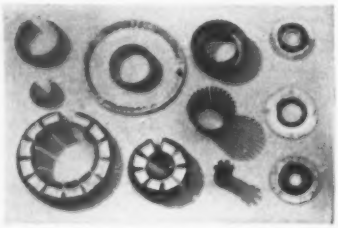
STRIP SPRINGS

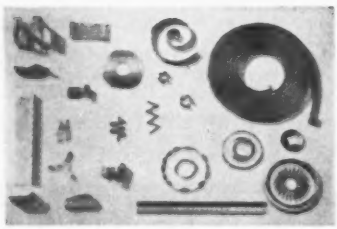
Fabricated from beryllium copper.
Easily handled, readily broken apart by hand or used in automatic or semi-automatic assembling devices and contact riveting machines.
Individual pieces may be broken off without trace of burr.
Eliminate sorting, untangling and handling of loose pieces.
Springs may be produced in strips to various shapes; formed angles may be held within plus or minus one degree.
Heat treated in multiple fixtures to insure uniformity, close tolerances and elimination of variations in spring-back.

COIL SPRINGS

Made from laboratory tested beryllium copper wire. Special coil and heat treating equipment insures 100% uniformity.
Guaranteed rigid tolerances held on diameter and load tests at specified deflection.
These factors combine to assure increased service life through higher endurance strength—make products perform more consistently by eliminating drift, set or fatigue. Furthermore, they eliminate expensive hand adjustment and reduce inspection costs of finished product.

FOR LOW ACTIVITY





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We are equipped to supply standard mating parts for use with 2C-39, 2C-40, 2C-43 and 3C-37 tubes, or custom made parts in related fields.

Grounding strips and contact fingers can be supplied in standard or special contours.

"Flea" contacts for subminiature tubes.

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For those who need quick delivery of parts in pilot quantities or require a low-cost proving ground for spring designs. I-S methods eliminate expensive tooling. Laboratory controlled, precision produced—yet at lower cost than is possible with permanent, high-activity tools.

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When your product is in the design stage, let us show you how I-S springs of beryllium copper may be designed to fit your needs. Ample stock, flexible facilities, short set-up time speed production of sample lots and trial orders.

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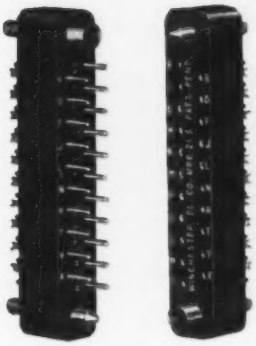
CONNECTOR ENGINEERING THAT KEEPS PACE WITH YOUR SPECIAL REQUIREMENTS

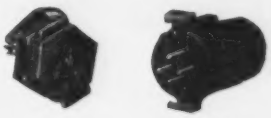
MANUFACTURED IN ACCORDANCE WITH JAN REQUIREMENTS, OR TO MORE RIGID HIGH ALTITUDE, HIGH VELOCITY SPECIFICATIONS.



MRE21P MRE21S
(actual size)

MINIATURES

Available with 4, 5, 6, 7, 9, 12, 14, 18, 21, 34, and 50 contacts in round and rectangular connectors.



M4S M4P
(actual size)

Many new miniatures have been added to our extensive line, including pressurized, high voltage, and shell-enclosed types. These connectors are ideal for aircraft equipment and instrumentation, where compactness and light weight are of utmost importance.

QRE18S QRE18P
(actual size)
Pat. No. 2,466,370 other patents pending

SELF-SEPARATING, SELF-ALIGNING CONNECTORS FOR POWER, CONTROL, AND COMMUNICATIONS CIRCUITS

Now available in 12, 18, 24, and 34 contacts, this versatile connector employs spring loaded contacts, eliminating the prying and pulling necessary when separating ordinary multi-contact connectors. Particularly suitable for rack and panel type equipment, the self-separating and self-aligning features make special levers unnecessary.

Available for use with these connectors are: bayonet locking guide pins, cable clamps, neoprene hoods, mounting brackets, and pressurized plugs.

All contacts are precision machined, and gold plated over silver. Moldings are of melamine for high arc resistance and mechanical strength. Monobloc construction minimizes the number of creepage paths and eliminates the forming of moisture pockets.

COMPLETE CATALOG OF ENGINEERING DATA AVAILABLE. PLEASE SEND REQUEST ON COMPANY LETTERHEAD.

WINCHESTER ELECTRONICS, INCORPORATED

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TAPE RECORDERS

Sonar

R.P.A.-1

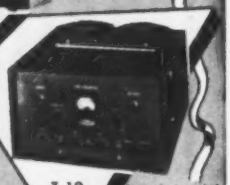
The T-10 has 3 inputs—2 low gain and 3 high gain—for microphone and radio inputs. Amplifier response 20 to 20,000 CPS ± 1 db. Tape response (7.5" per sec.) 30 to 9,500 CPS. WOW and FLUTTER less than 0.3%. The T-10 recorder is available in separate units so that duplication of present equipment is not necessary.

R.P.A.

Compare this unit with those costing 2 to 3 times as much R.P.A.-1 net price $275.00

Tape speed —7.5" and 15" per sec. $50.00 extra.

The RPA amplifier will work with any radio or high fidelity amplifier, to record, play back, or erase tape, using any tape mechanism. Complete $45.00



T-10

Complete with Speaker and power supply (in separate cabinet) and 1200 ft. reel of tape. $395.00

RPA 10 amp. only $175.00.

The R.P.A.-1 is a broadcast, high fidelity tape recorder especially suited to small FM-AM Broadcast stations. Ideally suited for remote recording and feeding a phone line simultaneously, the R.P.A.-1 is equipped with two inputs, one for a low impedance microphone and one for bridging. The output level is 0 db to a balanced 600 ohm line. The frequency response at 7.5" p.s.—40 cycles to 9.5 kc. ± 2.75 db. Built-in earphone monitoring facility. Loud speaker monitoring with a 5" dynamic speaker having its own gain control. The master gain control is calibrated in steps of 2 db. The R.P.A.-1 has a built-in RF filter enabling operation along side high power transmitters and so simple to operate, the personnel need not be an engineer or technically inclined.

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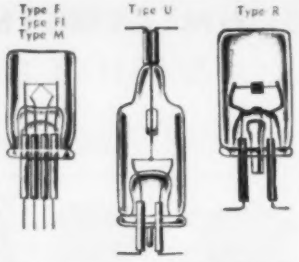
SONAR RADIO CORPORATION

General Offices & Factory: 59 MYRTLE AVE., B'KLYN 1, N.Y.

Type F
Type FI
Type M

Type U

Type R



FIELD VACUUM THERMOCOUPLES

- TYPE F, contact type, and TYPE FI, with insulated heater, available in ranges of 1.2 milliamperes and over.
- TYPE M, contact type, 25 MV output, constructed in ranges of 100 milliamperes and over.
- TYPE U, with insulated heater, for measurements at ultra-high frequencies, made in ranges of 3 milliamperes and over. Streamlined to make convenient use in coaxial cables or fittings possible.
- TYPE R, for radiant energy measurements.

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Simple • Reliable • Economical

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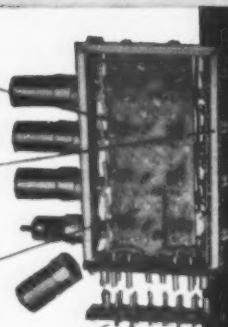

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Four large, easy reading, bulls-eye glow lamps — replaceable socket type

All components turret-lug mounted and accessible . . . all wiring color coded

Special silver plated, self-aligning contact and rigid connectors for positive mechanical mounting

DIRECT DECIMAL READ-OUT — FOUR NEON GLOW LAMPS DESIGNATED 1-2-4-8 PROVIDE DIRECT INDICATION (0-9) AND INSTANTANEOUS LOCATION OF ANY DEFECTIVE TUBE

STABLE OPERATION — WIDE VOLTAGE RANGE

HIGH COUNTING RATES — UP TO 130,000 PER SECOND ABSOLUTE ACCURACY GUARANTEED.

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A NEW LOW UNIT PRICE OF $45.00 IS ANNOUNCED AS A RESULT OF WIDE ACCEPTANCE AND QUANTITY PRODUCTION

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87 leading research laboratories use daily hundreds of our "A" series power supplies.

For general laboratory use, the A 3 is worthy of adoption as STANDARD equipment.

*Described in MIT Radiation Laboratory Series Vol. 21, Electronic Instruments.

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Oregon ELECTRONICS MFG. CO.

206 S.W. WASHINGTON ST., PORTLAND 4, ORE., U.S.A.

RMC DISCAPS

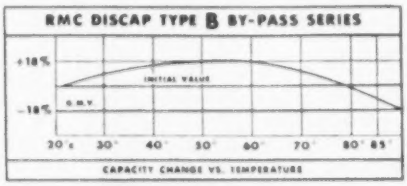
The Newest Development In Miniature Ceramic Condensers

TYPE B-GMV BY-PASS SERIES

EXCEED GMV CAPACITY AT 85°C

Type B—GMV DISCAPS are engineered to exceed guaranteed minimum capacity at 85° C with 250 applied D.C.V. Capacity change between room temperature and 65° C is only +18%, —0%. This accomplishment in a small practical size results in a decidedly more effective by-pass at the higher frequencies encountered in TV and FM applications.

DISCAPS in the Type B—GMV Series are available in all standard capacities from .001 MFD. to .01 MFD. and in dual capacities from 2 x .001 MFD. to 2 x .01 MFD. Approval by leading makers of TV sets and tuners, as well as by manufacturers of specialized high frequency equipment is proof of DISCAP superiority.



TYPE GP INSULATED DISC

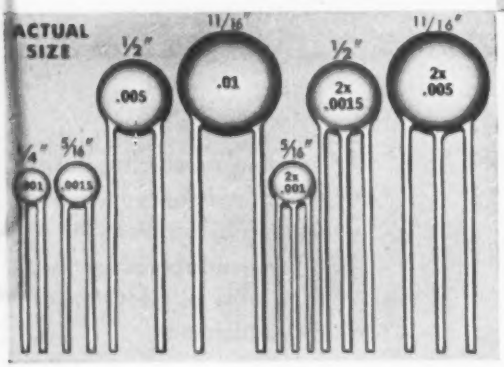
GENERAL PURPOSE LOW CAPACITY SERIES

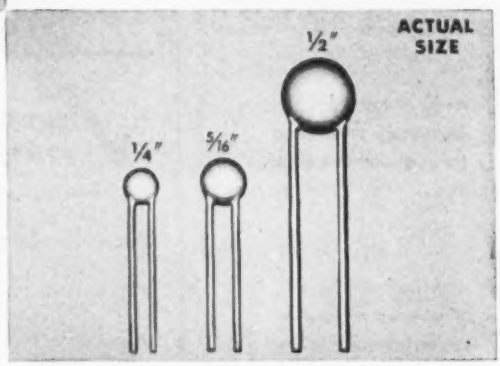
The new GP Series DISCAPS offer for the first time a disc type general purpose zero or negative 750 temperature coefficient disc condenser ideally suited to coupling and tuned circuit applications.

GP Series DISCAPS feature small size, low self inductance, higher working voltage (600 V.D.C.), low power factor, greater mechanical strength and faster production line handling. Their low cost, plus their inherent quality characteristics make GP Series DISCAPS attractive to all manufacturers of high frequency equipment. Type GP Series DISCAPS are available in a variety of capacities and tolerances to suit most every requirement.

Type	CAP. MMF. ⅛" Body Dia.	CAP. MMF. ¼" Body Dia.	CAP. MMF. ½" Body Dia.
NPO		5-10	15-20-25-30
N750	5-10	20-25-30	50-75-100-125

Available Tolerances ±5%, ±10%, ±20%





Every DISCAP is 100% Tested for Capacity, Leakage Resistance and Breakdown

RMC production checks eliminate costly service failures. Because RMC produces the complete condenser, even to the processing of the dielectric element itself, it is possible to exercise the finest quality control. Yes, DISCAPS are definitely better!

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RADIO MATERIALS CORPORATION

GENERAL OFFICE: 1708 Belmont Ave., Chicago 13, Ill.

FACTORIES AT CHICAGO, ILL. AND ATTICA, IND.

Two RMC Plants Devoted Exclusively to Ceramic Condensers

All these E-V FIRSTS

KEEP YOU AHEAD
IN DESIGN . . . IN FEATURES . . . IN SALES

MICROPHONES

Again and again, E-V research has been way ahead in ideas . . . to keep E-V Distributors way ahead in sales. Among E-V microphone firsts are the new slim, trim TV 655 . . . the Broadcast 650, 645 and 635 . . . the high fidelity 630 . . . the 950 Dual Response Cardax . . . the plus-value Mercury . . . the unique Century . . . the Mobile Mikes . . . the noise-cancelling Differentials. Also such innovations as the Acoustalloy Diaphragm . . . Speech Clipper . . . Touch-to-Talk Stand . . . Button Control . . . Floor Stand . . . Blast Filter. They serve all fields, tap new markets.

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E-V TORQUE DRIVE revolutionized crystal cartridge design and performance. Exclusive features made it readily adaptable to all speeds and all requirements . . . and quickly made E-V a major producer in this field. TORQUE DRIVE Cartridges are now used as original equipment by leading manufacturers of changers and record players. For the replacement market, E-V created the Series 12 "Basic 3" which simplifies servicing for 78 rpm . . . the Series 14, 34, etc., for 33⅓ and 45 rpm . . . the Series, 16 Twill for all 3 speeds . . . etc. (New Models 50 and 60 low-cost standard-type cartridges are now also available.)

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After intensive research, E-V presents startling new ideas in High Fidelity Speakers—a complete line that will team up with your other E-V sales winners, and broaden your market. You will be impressed with their performance, their value. You will offer them with utmost confidence for all types of high fidelity applications.

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TUNGSTEN RIBBON

SIZES:

Widths from .004" up to .125"
Thicknesses from .040" down to .001"

Down to .0008" at widths up to .060"
Down to .0005" at widths up to .040"
Down to .0002" at widths up to .006"
Tungsten ribbon made to above sizes is manufactured from round, ductile wire.
CHEMICAL PURITY: 99.9% pure
FINISH: Roll finish—black or cleaned
CAMBER: Approximately 1/16" in 2" lengths
EDGES: Slightly rounded and smooth

TOLERANCES:

Thicknesses:	.0005" to .001"	±	.00005"
	.002"	±	.0001"
	.003"	±	.00015"
	.004"	±	.0002"
	.005" to .006"	±	.00025"
	.007" to .010"	±	.00035"
	.011" to .030"	±	.0005"
	.031" to .040"	±	.001"
Widths:	.006" to .010"	±	.0005"
	.011" to .020"	±	.001"
	.021" to .030"	±	.0015"
	.031" to .060"	±	.002"
	.061" to .093"	±	.003"
	.100" to .125"	±	.005"

Supplied to mg. wgt.—if required.

STRIP

Widths up to 1 1/2" with thickness down to .001" in random lengths 6" and up. This is rolled from heavy strip.

THORIATED

Widths up to .125" down to .001" thick
Widths up to 1/2" down to .002" thick
Wgt. per Sq. In. at .001" Thickness is 0.316 Grams

MOLYBDENUM RIBBON

SIZES:

Widths from .006" up to .250"
Thicknesses from .060" down to .0006"

Molybdenum Ribbon made to above sizes is manufactured from round, ductile wire.
CHEMICAL PURITY: 99.9% pure
FINISH: Roll polished finish, cleaned
CAMBER: Approximately 1/16 in 2" lengths
EDGES: Slightly rounded and smooth

TOLERANCES:

Thicknesses:	.0006" to .001"	±	.00004"
	.0011" to .010"	±	.00025"
	.011" to .030"	±	.0003"
	.031" to .060"	±	.0005"
Widths:	.006" to .010"	±	.0005"
	.011" to .020"	±	.001"
	.021" to .030"	±	.0015"
	.031" to .090"	±	.002"
	.091" to .125"	±	.003"
	.126" to .160"	±	.0035"
	.161" to .250"	±	.005"

Supplied to mg. wgt.—if required.

STRIP

Widths up to 2" with thicknesses down to .001" in random lengths 6" and up. This is rolled from heavy strip.

Wgt. per Sq. In. at .001" Thickness is 0.167 Grams

INQUIRIES ON FORMED PIECES MADE OF TUNGSTEN OR MOLYBDENUM RIBBON AND STRIP, OR THORIATED TUNGSTEN WILL RECEIVE PROMPT ATTENTION.

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PROTECT
YOUR PRODUCT
at point of strain

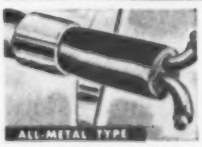
Protect product salability too — by insuring long life for cords, cables and conductors. Genuine "GRIPMASTER" Strain Reliefs provide these vital features—

- ★ Anchor cords to housings
- ★ Eliminate taping or threading
- ★ Prevent unraveling
- ★ Prevent cord pull damage
- ★ All sizes and styles
- ★ Easy to apply
- ★ Inexpensive

Gripmaster Strain Reliefs are "tremendous trifles" that make good products better!

Ask for samples.

4 WAYS TO END ALL CORD AND CABLE SERVICE FAILURES *Economically*


ALL-METAL TYPE

CLICK-ON TYPE

INSULATED TYPE

GRIPMASTER STRAIN RELIEFS

Interruptions due to cable and cord connection failures are eliminated because they anchor the cord to the product at the point of strain. GRIPMASTER Strain Reliefs can withstand pulls up to 100 lbs., and are acceptable to Underwriters Laboratories. All types Reg. U. S. Pat. Off.

WIRE BINDING SLEEVES—Preventing fraying of cord ends, these specially-treated rubber tubes are available in five sizes to fit wires to .790

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STRAIN RELIEF SPECIALISTS
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can rely on

Cramer

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QUALITY
ACCURACY

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Synchronous motor driven. Register automatically and cumulatively total operating or idle time on circuits, machines, systems.

TIME DELAY RELAYS

Provide adjustable or fixed time delay between operation of a control circuit and subsequent opening or closing of a load circuit.

SYNCHRONOUS MOTORS

Permanent magnet type for applications requiring a constant speed at a given frequency. Small size. 30" ounce torque. Twenty-eight speeds from 60 rpm to 1/24 rph.

For a wide range of standard timers and controls, or special adaptations for specific applications, consult R. W. CRAMER CO., Box No. 27, Centerbrook, Conn.

Cramer

SPECIALISTS IN *TIME* AS A FACTOR OF *CONTROL*

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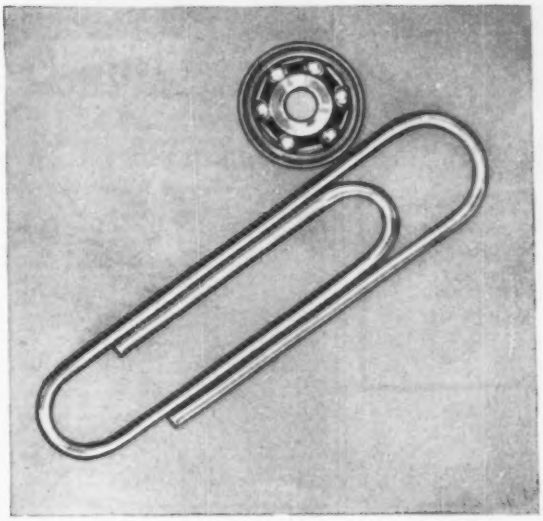


Ground
miniature bearings are obtainable and at
NO EXTRA COST!

The major development of the decade in anti-friction bearings, Micro *Ground* miniature ball bearings are made possible by

- ★ Production skill and "know-how."
- ★ The last word in machine tools and equipment.
- ★ Precision grinding spindles of 100,000 rpm and more.

RESULT: The smooth performance and accurate geometry of GROUND Bearings is now available in sizes as small as 1 mm (.040") bore x ⅛" O.D., with the millionths inch refinement of ABEC-7.

Micro bearings are the only ball bearings of less than ⅜" O.D. manufactured in the United States with *ground* outer raceways and O.D. Ideal for applications requiring the ultimate in precision, they provide accurate fit, high capacity and long life obtainable only in precision ground bearings. Yet they offer you these advantages at no premium in cost — size by size and type by type, they are actually priced below comparable unground miniature bearings.

Supplied in high carbon chrome alloy steel, stainless steel, non-magnetic corrosion-resistant beryllium-copper, and special materials, if desired. Designs include: Full Race Radial, Extra Light Radial, Conrad Radial, Angular Contact, Pivot, Self-Aligning, and Special Purpose types.

Write today for Technical Bulletin No. 50, showing the full range of Micro Bearings now being furnished to many of America's leading manufacturers of precision products and equipment.

New Hampshire *Micro* Ball Bearings, Inc.

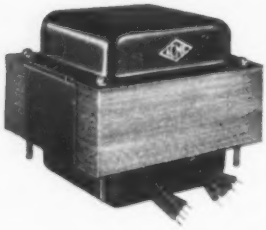
5 MAIN STREET, PETERBOROUGH, NEW HAMPSHIRE

FOR BETTER PERFORMANCE
BETTER BUY
Acme ACME Electric TRANSFORMERS

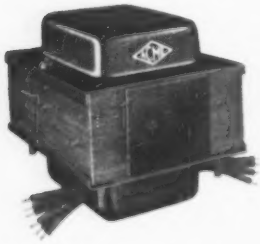
Acme Electric transformers are the silent partners in many of the miracle making electronic products that operate because of decimal point specifications. Whenever specifications are written to close tolerances, Acme Electric transformers will prove to be your best buy.

Our engineering staff will work with you to help make your product better thru better transformer performance.

Mounting type 131 with endbells, can be built in capacities from 35 to 500 VA from standard parts.



Television power transformer with copper shorting band.



Special transformer core clamping method. Permits flush chassis mounting.

Mounting type 141 with endbells and primary tap changer on front. Ratings from 35 to 500 VA available.

ACME ELECTRIC CORPORATION
31 BG Water St. Cuba, N. Y.

Acme ACME Electric TRANSFORMERS

CLARK

CRYSTAL OVENS
for accurate frequency stabilization

Housings available for from 1 to 5 std crystal units.
- Current drain — .85 to 2 amps @ 6V
- Operating temp — 40 to 90°C
- Operating voltages — 6, 12, 24, or 28 VAC or DC
- Stability — ±.2°C to ±3°C (—55 to +90°C)
- Stabilization time — 5 to 15 min. (—55 to +75°C)
- Std mountings — loctal, octal, 5 or 3 prong
- Thermostats — platinum iridium contacts
  - single or dual units
  - hermetically sealed

HSM type **CRYSTALS** for accurate frequency control of LF, MF, HF, and UHF — Wire or pressure mounted-hermetically sealed
- Capacitance — 7 mmf maximum
- Circuits — parallel or series resonant
- Frequency range — 50 kc to 100 mc
- Frequency calibration — .02% to .0005%
- Frequency stability .02% to .003% (—55 to +90°C — without oven)
- Mountings — std ½", octal, loctal or wire leads
- Resistance — as low as 10 ohms
- Specifications — CAA, FCC, JAN or commercial

PM type **CRYSTALS** for accurate frequency control of MF and HF. Pressure or spacer mounted between stainless steel electrodes and sealed in phenolic holders.
- Frequency range — 250 kc to 30 mc
- Frequency calibration — .02% to .001%
- Frequency stability — .02% to .005% (—55 to +90°C)
- Mountings — std ½", ¼", 3 prong or octal
- Specifications — CAA, FCC, JAN or commercial

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- Secondary Standards
- UHF Converters
- Audio Frequency Meters
- Crystal Controlled Oscillators
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ULTRASONIC CRYSTALS — plated resonators for generators and receivers.
- Frequency range — 250 kc to 30 mc
- Frequency calibration — 2% to .005%
- Type of crystals — X-cut quartz or tourmaline
- Plating — aluminum, chromium, copper, gold, nickel or silver
- Lateral dimensions — 1 cm to 10 cm dia or sq.
- Surfaces — plano, plano-concave, or concave-convex
- Contours — 5 cm to 100 cm radius of curvature
- Finishes — etched or polished

ULTRASONIC EQUIPMENT — Complete for experimental or production work
- Generators — .2 to 3 kw
- Impedance Matching Networks — high impedance
- Crystal Transducers — 60 kc to 30 mc — for use in conducting or non-conducting liquids

OPTICAL CRYSTALS — fabricated to customer specifications for any optical application
- Bertrand plates
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- Retardation plates
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is a list of more than

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and
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willing to serve you.

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to mention the . . .

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GUIDE

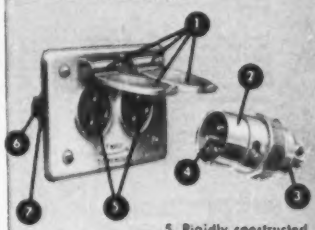
New R&S AUTOMATIC LOCKING Midget EVER-LOK
PLUGS, RECEPTACLES & CORD CONNECTORS
FOR COMMERCIAL AND INDUSTRIAL APPLICATIONS

10 Amp. 250 V.
15 Amp. 125 V.
A.C. or D.C.

Small size solves space problems. Typical uses: business offices, institutional buildings, industrial plants, etc. Adaptable as component for portable electrical equipment: electric machine tools, communication and sound equipment, X-ray apparatus, etc. Embody all dependable features of larger Ever-Lok units, plus advanced improvements.

1. Spring hinged, gasketed covers close receptacle when not in use.

2. Plated steel housings fully protect the contacts.



3. Adjustable Cord Grips eliminate strain on connections.

4. Contacts are precision-made, self-wiping, and self-aligning.

5. Rigidly constructed, all interiors of molded arc-resisting composition.

6. Heat-treated beryllium copper contacts and terminals . . . an advanced EVER-LOK feature.

7. Compact design provides ample capacity, yet allows for easy wiring.

New 12-page catalog fully describes all types, dimensional drawings, ordering information, etc.
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Adaptable as components for:

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Amplifiers:
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Broadcast Input Control.
Cameras:
- Cathode Ray Oscillograph,
- Television, and
- X-Ray.

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Communication Systems:
- Airport Traffic Control,
- Portable Installation,
- Radiotelatype, etc.

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- Sorting, and
- Register, etc,

Converters:
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- Strain.

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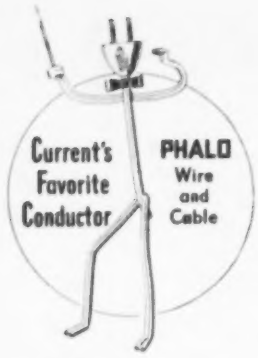
Transmitters.
Turntables:
- Recording and Transcription.

Vibration Analysis Equipment.
X-Ray Equipment.



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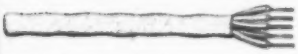
For All Your Electronic Wire Requirements!

Multiple Conductor Paired and Unpaired Cables



For telephone and telegraph communication systems.

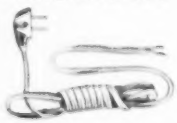
Microphone Cables

Cables for Intercommunicating and Public Address Systems

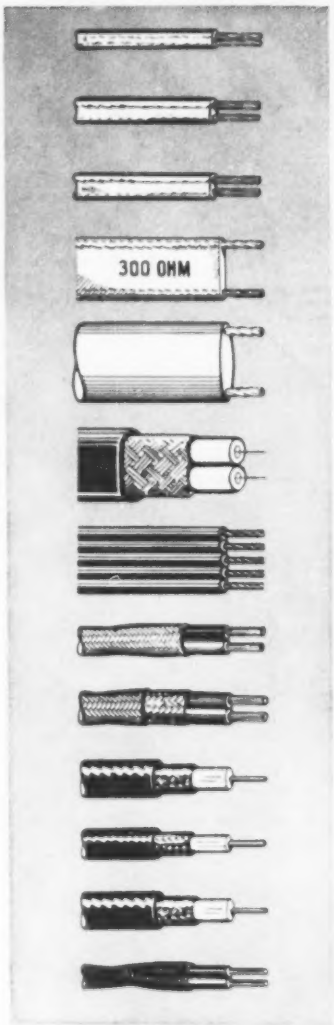
Three flexible stranded tinned copper conductors, vinyl plastic insulation; color-coded, cabled conductors; tinned copper braid shield; over-all cotton braid jacket.

One pair solid tinned copper conductors, vinyl plastic insulation, color coded; cabled construction; over-all cotton braid jacket.

PHALO Cord Sets



TRANSMISSION LINE CABLES



Applications

72-Ohm cable for use with receiving antennas—high frequency.

100-Ohm cable for use with receiving antenna, link connection, matching transformer. Also for experimental use at high frequency.

150-Ohm cable for use with receiving antenna, matching transformer and high frequency experimental applications.

300-Ohm for use with FM and Television receiving antenna.

300-Ohm heavy-duty cable. Same applications as above and also for low power transmitting antenna.

300-Ohm shielded cable. FM and Television lead adaptable to noisy locations.

3, 4 & 5 Conductor Antenna rotator control cable.

75-Ohm cable for use with doublet receiving antenna—low frequencies.

Same as above with added shield to reduce noise pick-up.

72-Ohm coaxial cable for television antenna.

52-Ohm cable for pulse and radio frequency transmission, television.

75-Ohm coaxial low loss.

For extension speakers, control circuits and low frequency doublet receiving antenna.

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Hook up wires UL approved for 80 C, 90 C and 105 C operating temperatures.

Your Inquiries Will Receive Prompt Attention!

PHALO PLASTICS CORPORATION

Graphic Arts Building, Worcester, Massachusetts

PLASTICON CAPACITORS

HI VOLT POWER SUPPLIES

Designed to transform 118V AC to high voltage—low current DC for use in radiation counters, oscilloscopes, dust precipitators, projection television sets, spectographic analyzers, photoflash equipment, etc. Hi Volt Power Supplies are self-contained in hermetically sealed steel containers.

Cat. No.	VDC	Dimensions	List Price
PS-2	2400	3 3/16 x 3 3/4 x 5 1/2"	$25.75
PS-5	5000	4 9/16 x 3 3/4 x 6 1/2"	[illegible]
PS-10	10000	4 9/16 x 3 3/4 x 8"	[illegible]
PS-15	15000	7 x 7 x 7 13/16"	250.00
PS-30	30000	7 x 7 x 7 13/16"	250.00
PS-50	50000	12 1/2 x 12 1/2 x 12 1/2"	775.00

Send us your specifications on 400-2800 cycle input, DC output Power Supplies. Large savings in volume and weight can be made over the 60 cycle sizes.

Battery input, high voltage DC output Supplies can also be furnished. Write for information on the PS1B; designed to power Geiger Counters from flashlight cells.

PLASTICONS

By the use of synthetic plastic film dielectrics, PLASTICONS can be made smaller, lighter, more efficient and more economical than older types of capacitors made with paper and mica insulation. Plasticon films are chemically purer and more uniform. Plasticon capacitors have a longer life and can operate under more severe conditions.

SPECIAL PLASTICONS

Taking advantage of the wide variety of plastic film dielectric characteristics, Plasticons are engineered to meet many special applications, among which are the following:

ENERGY STORAGE: Type AOCE are the lightest, smallest discharge capacitors available. Standards range from 7.6 Watt seconds at 2250V to 200 Watt seconds at 4000V. Specials up to 250kv are made to specifications.

HIGH TEMPERATURE: Plasticon TA and TS capacitors can be furnished for 200° C operation.

ZERO COEFFICIENT: Plasticon Type (AL) can be furnished from +800 to −800 parts per million per degree Centigrade.

HIGH RESISTANCE: Plasticon Type FA is available in resistance up to 10^{13} ohms. Type FS measures 10^{13} ohms at 4000V.

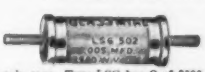
PULSE FORMING NETWORKS: Type TS and LS made to specifications for Type E PFN's. Smaller and lighter than paper capacitor networks. Type TS PFN's operate up to 150° C. Type LS networks up to 75° C.

GLASSMIKES ASG

Type ASG are Plasticon A film-silicone fluid impregnated capacitor elements in hermetically sealed glass tubes. Temperature range 60° C to + 125° C. The smallest and lightest high voltage capacitors made. Type ASG are ideal for DC and low frequency AC applications. Temperature derating information on request.

Cat. No.	Cap. Mfd.	Volts D.C.	Dimensions	List Price
ASG 1	01	600	⅛x1 ⅛"	$1.50
ASG 2	02	600	⅛x1 ⅛"	1.60
ASG 3	05	600	⅛x1 ⅛"	1.75
ASG 4	1	600	⅛x1 ⅛"	1.95
ASG 5	25	600	⅛x2½"	2.25
ASG 6	5	600	⅛x2½"	2.60
ASG 7	005	1,000	⅛x1 ⅛"	1.50
ASG 8	01	1,000	⅛x1 ⅛"	1.60
ASG 9	02	1,000	⅛x1 ⅛"	1.70
ASG 10	05	1,000	⅛x1 ⅛"	1.85
ASG 11	1	1,000	⅛x2½"	2.15
ASG 12	25	1,000	⅛x2½"	2.50
ASG 13	002	2,000	⅛x1 ⅛"	1.90
ASG 14	005	2,000	⅛x1 ⅛"	2.05
ASG 15	01	2,000	⅛x1 ⅛"	2.25
ASG 16	02	2,000	⅛x1 ⅛"	2.50
ASG 17	05	2,000	⅛x1 ⅛"	2.80
ASG 18	1	2,000	⅛x2½"	3.20
ASG 19	25	2,000	⅛x2½"	3.70
ASG 20	001	3,000	⅛x1 ⅛"	5.15
ASG 21	002	3,000	⅛x1 ⅛"	5.25
ASG 22	005	3,000	⅛x1 ⅛"	5.40
ASG 23	01	3,000	⅛x1 ⅛"	5.60
ASG 24	02	3,000	⅛x1 ⅛"	5.85
ASG 25	05	3,000	⅛x2½"	6.15
ASG 26	1	3,000	⅛x2½"	6.50
ASG 27	001	5,000	⅛x1 ⅛"	6.50
ASG 28	002	5,000	⅛x1 ⅛"	6.70
ASG 29	005	5,000	⅛x1 ⅛"	6.95
ASG 30	01	5,000	⅛x1 ⅛"	7.25
ASG 31	02	5,000	⅛x2½"	7.65
ASG 32	05	5,000	⅛x2½"	8.15
ASG 33	1	5,000	⅛x3½"	9.10
ASG 34	001	7,500	⅛x1 ⅛"	7.00
ASG 35	002	7,500	⅛x1 ⅛"	7.25
ASG 36	005	7,500	⅛x1 ⅛"	7.55
ASG 37	01	7,500	⅛x2½"	8.15
ASG 38	02	7,500	⅛x2½"	9.25
ASG 39	05	7,500	⅛x2½"	11.50
ASG 40	0005	10,000	⅛x1 ⅛"	7.30
ASG 41	001	10,000	⅛x1 ⅛"	7.50
ASG 42	002	10,000	⅛x1 ⅛"	7.70
ASG 43	005	10,000	⅛x1 ⅛"	9.00
ASG 44	01	10,000	⅛x2½"	10.50
ASG 45	02	10,000	⅛x2½"	12.50
ASG 46	05	10,000	⅛x3½"	15.00
ASG 60	06	10,000	⅛x3½"	17.50
ASG 47	0005	15,000	⅛x2½"	14.50
ASG 48	001	15,000	⅛x2½"	14.80
ASG 49	002	15,000	⅛x2½"	15.50
ASG 50	0005	20,000	⅛x3½"	19.50
ASG 51	001	20,000	⅛x3½"	20.50
ASG 52	0005	30,000	⅛x3½"	22.50

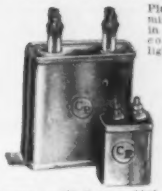
RF GLASSMIKES



Plasticon L film-silicone fluid impregnant in Glassmike style case. Type LSG has Q of 2500 to 5000. Rated at 3500 WV—7500 V Test. Lower losses, more easily mounted, smaller and more economical than mica capacitors. Higher voltage LSG's on request.

Cat. No.	Cap. Mfd.	Dimensions OD	Dimensions Length	List Price
LSG500	00005	⅛	1 ⅛"	$1.50
LSG101	0001	⅛	1 ⅛"	1.50
LSG251	00025	⅛	1 ⅛"	1.50
LSG501	0005	⅛	1 ⅛"	1.50
LSG102	001	⅛	1 ⅛"	1.70
LSG202	002	⅛	1 ⅛"	2.45
LSG502	005	⅛	1 ⅛"	3.50
LSG602	006	⅛	1 ⅛"	3.75
LSG103	01	⅛	1 ⅛"	4.25

INDUSTRIAL and TRANSMITTING



Plasticon A element; mineral oil impregnated in sturdy lead coated steel containers. Smaller lighter and more economical than paper capacitors. Temperature range — 40° C to +105°C. Type AOC-rectangular. Type AOCO-flattened oval Type AS(and AS(O (not listed) have Plasticon A element, silicone impregnated. Same dimensions as corresponding AO types. Temperature range — 60° C to + 125° C; greater capacitance stability. Prices on application. Temperature derating information on request.

DC RECTANGULARS

Cat. No.	Cap. Mfd.	Volts DC	Dimensions	List Price
AOC6C1	1 0	600	2⅛ 1¾ 1"	$3.74
AOC6C2	2 0	600	2¾ 1¾ 1"	4.51
AOC6C4	4 0	600	3⅛ 2⅛ 1⅛"	5.61
AOC6C8	8 0	600	4 3⅛ 1⅛"	8.47
AOC6C10	10 0	600	4⅝ 3⅛ 1⅛"	9.52
AOC1M1	1 0	1,000	2⅜ 1¾ 1"	4.02
AOC1M2	2 0	1,000	4 1¾ 1"	5.39
AOC1M4	4 0	1,000	4 2½ 1⅛"	6.54
AOC1M8	8 0	1,000	4⅝ 3⅛ 1⅛"	9.24
AOC1M10	10 0	1,000	4⅝ 3⅛ 1⅛"	10.67
AOC2MO5	0 5	2,000	2⅜ 1¾ 1"	4.84
AOC2M1	1 0	2,000	3½ 1¾ 1"	5.88
AOC2M2	2 0	2,000	3½ 2½ 1⅛"	6.82
AOC2M4	4 0	2,000	3½ 3¾ 1⅛"	9.24
AOC3M1	1 0	3,000	4 2½ 1⅛"	12.10
AOC3M2	2 0	3,000	4 3¾ 1⅛"	15.40
AOC3M4	4 0	3,000	4⅝ 3¾ 2⅛"	21.28
AOC4M1	1 0	4,000	4 3¾ 1⅛"	27.50
AOC4M2	2 0	4,000	4 3¾ 1⅝"	33.00
AOC4M4	4 0	4,000	4 3¾ 4⅛"	50.44
AOC5M1	1 0	5,000	4 3¾ 1⅝"	33.00
AOC5M2	2 0	5,000	3½ 3¾ 4⅛"	41.25
AOC75C1	1 0	7,500	3½ 3¾ 4⅛"	49.50
AOC10M1	1 0	10,000	4 3¾ 4⅛"	88.00

DC OVALS

Cat. No.	Cap. Mfd.	Volts D.C.	Dimensions	List Price
AOCO6C2	2 0	600	2⅜ 2 1¼"	$4.40
AOCO6C4	4 0	600	4 2 1¼"	5.28
AOCO1M1	1 0	1,000	2⅜ 2 1¼"	3.85
AOCO1M2	2 0	1,000	3½ 2 1¼"	5.17
AOCO3MO1	0 1	3,000	2⅜ 2 1¼"	7.59
AOCO5MO1	0 1	5,000	2⅜ 2 1¼"	14.08
AOCO5MO25	0 25	5,000	3½ 2 1¼"	15.40
AOCO5MO5	0 5	5,000	4⅝ 2 1¼"	18.15
AOCO8MOO5	0 05	8,000	2⅜ 2 1¼"	15.18
AOCO8MO1	0 1	8,000	3½ 2 1¼"	16.72
AOCO10MOO5	0 05	10,000	3½ 2 1¼"	19.25

LABORATORY CAPACITORS

Type LAG (Glassmike style) and Type LAC (Rectangular can) have the lowest dielectric absorption of any capacitor made. Residual charge is .01 — .02%. Dissipation factor at 1 MC is .0002 to .0005. Capacitance and Q is constant from DC to 100 KC. Resistance averages one million megohms per microfarad. Capacitance tolerances available: ± 5%, ± 2%, and ± 1%. Type LA units are used for computers and in timing and integrating circuits.

Cat. No.	Cap. Mfd.	Dimensions
LAG101	0001	⅛x1 ⅛"
LAG201	0002	⅛x1 ⅛"
LAG501	0005	⅛x1 ⅛"
LAG102	001	⅛x1 ⅛"
LAG202	002	⅛x1 ⅛"
LAG502	005	⅛x1 ⅛"
LAG103	01	⅛x1 ⅛"
LAG203	02	⅛x2⅛"
LAG503	05	⅛x2⅛"
LAC104	1	2⅛x1⅝x1"
LAC204	2	2⅛x2⅛x1⅛"
LAC504	5	4x2⅛x1⅛"
LAC105	1	4x3⅛x1⅛"
LAC205	2	4x3⅛x2⅛"
LAC505	5	6x3⅛x4⅛"

Prices Upon Application

Condenser Products Company
CHICAGO 22, ILLINOIS

VIBRATION DETECTION EQUIPMENT

Sono-Probe: A three-stage electronic amplifier with contact probe pick-up unaffected by airborne noise, supplied with both meter and earphones for quantitative and qualitative vibration analysis.

Use is indicated for quality control and production testing of industrial units, assemblies and sub-assemblies, as well as household appliances, where noise and vibration are present.

Simplified operation permits use by non-technical personnel.

Available in Bench Model SR and SRA, for 60-cycle, 115-V. A-C: Also battery operated Portable Model.

Sono-Probe Correlator: a constant frequency signal source, with metered output, permitting positive return to previously established standards of acceptability. Also useful in correlating more than one vibration detection instrument (Sono-Probe or other manufacture) for tracking purposes.

Magneto Synchronizer: Standard tool for synchronizing dual ignition systems.

Specialized equipment for vibration analysis as a guide to use of machine capacity (for time study); for electronic control of automatic machinery; and other applications.

Write for information

AIRCRAFT ELECTRONICS ASSOCIATES, INC.
1031 New Britain Ave. **Hartford 10, Conn.**

"Bepco" MOLDED TERMINAL BLOCKS

For HEAVY DUTY SERVICE TO 35 AMPERES - 600 VOLTS

AVAILABLE IN 4, 8 and 12 Circuit Sizes in both SCREW and SOLDERLESS types

CHECK THESE FEATURES

- ✓ RUGGED ONE PIECE MOLDINGS!
- ✓ BASES OFFSET FOR CREEPAGE!
- ✓ HIGH REINFORCED BARRIERS!
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- ✓ REVERSIBLE MARKING STRIPS!
- ✓ HOLES FOR COVER MOUNTING!

Also Available: - Covers, with attaching screws. Numbered Marking Strips (1 to 4, 1 to 8, 1 to 12).

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Electrical Products Corporation
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Quality controlled

SAPPHIRE and GLASS JEWEL BEARINGS

Performance proved for precision and long life by world's leading makers of *electrical, aircraft and timing instruments; compasses; weather recorders; all testing, indicating and recording apparatus.*

Unset or set in screws or bushings to suit requirements. Write for brochure.

Serving industry with fine jewels since 1913

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a plus feature

Immediately following the Product Listings in the **DIRECTORY SECTION** of this Issue is a list of more than

2500 TRADE NAMES

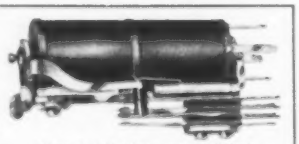
of electronic and allied products.

They are intended for your use in determining the manufacturer's name when only a trade name is known.

KURMAN RELAYS

Reliable • Powerful • Constant

For all types of Automatic Controls, Keying, Antenna Changeover, Burglar Alarms, Closed Circuit Applications.



Class A (all other types available)

Series 43

TELEPHONE Class A—Multicontact . . . Pin Hinge. Complete range of contacts up to 28 Springs. Wide variety of contact materials. Can be provided for slow operate, slow release, or slow acting. 4 a 1-T/03 a 1-S.

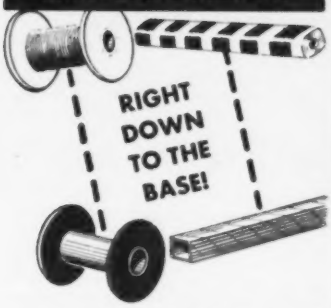
Sensitive Miniature Relay—Series 43 . . . Suitable for use in plate circuit and other control applications where low current consumption, small size, and adjustable contacts are important factors. DC sensitivity 20 to 18 milliwatts. Balanced armature. Contacts available—single pole double throw; also available in dust proof 5-prong container.

Prompt deliveries. Prices quoted on request.

Write for Issue 2.

KURMAN ELECTRIC CO., INC.
35-18 37th St. **Long Island City 1, N. Y.**

BE SURE your coils are accurate



PRECISION
PAPER TUBES

Die-formed under heat and pressure for greater uniformity, greater strength, less weight. No need for forming after winding. Automatic stacking. Made of finest dielectric kraft, fish paper, cellulose acetate or combinations—any shape, size, ID, OD—engineered *exactly* to your specifications. More effectively resist moisture, oil and heat. Cost you less. Send today for samples, new mandrel list of 1,000 sizes.

PRECISION
BOBBINS

Need no insulation strips, permit closer winding, stronger magnetic field. Afford lower moisture absorption. Spiral winding, heavy heat-treated compression, swaged tube-ends securely locked, overall impregnation are the reasons. Cores in any shape or length. Flanges embossed or recessed . . . die-cut in any size or shape . . . with slots and/or holes for terminal wiring. Write today for samples in dielectric kraft, fish paper, cellulose acetate, combinations. Ask for mandrel list—many new sizes.

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World Famous

Radio, Television and Electronic Instruments

PROFESSIONAL DYNAMIC MUTUAL CONDUCTANCE TUBE TESTER
Model 539

Tests all latest tubes (in micromhos) including ruggedized types. Choice of 3 AC grid signals: .25, .5 and 2.5 volts.
Extra large power transformer for accurate tests on high drain tubes.
Provision for self-bias.
Can insert plate milliammeter for measuring plate current.
Tests for gas, leakage and noise.

Model 209-A

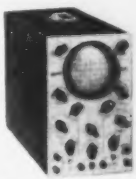
ELECTRONIC VOLT-OHM-CAPACITY MILLIAMMETER

Peak-to-peak or RMS voltage measurements.
RF readings to 300 megacycles.
Volts, AC-DC; and Mils DC: 0-3, 12, 30, 120, 300, 1,200.
Ohms: .1 ohm to 10,000 megohms—8 ranges.
Cap.: 0-10,000 mmf in 2 ranges. 0-1,000 mf in 5 ranges.
Ind.: 50 mh to 100 henries.

ALL-BAND MICROVOLT SIGNAL GENERATOR
Model 292-X

125 kc to 120 mc; 150 to 220 mc on fundamentals.
Modulated and unmodulated output: 1 to 100,000 microvolts.
Crystal oscillator available for accuracy to .005% in 152-162 mc, range.

GENERAL PURPOSE 5" OSCILLOSCOPE
Model 195-B



Sensitivity: .015 volts per inch.
Wide band amplifiers to 1 m.c.
Vertical input impedance, 1 megohm, 25 mmf Demodulator circuit. Blanking control.
Sinusoidal sweep with phasing control.

Model 465 TELEVISION DC KILOVOLTMETER

Measures to 30,000 volts.
Double range, low current drain.
10,000 ohms per volt sensitivity.
Well insulated phenolic case for operators protection.

Model 610-A COMPLETE ALIGNMENT GENERATOR

Markers for all IF frequencies.
Marker accuracy—0.5%.
Fully attenuated. 4.5 mc crystal included.
Aligns RF channels 2 thru 13 & all traps.

Model 620—TELEVISION LINEARITY PATTERN GENERATOR

Checks relative receiver sensitivity.
Provides for checking and aligning of . . . Horizontal and vertical linearity and drive, width, height and hold controls; and horizontal AFC circuits.
All independent of TV transmitter.

250° Meters—Long scale, compact and accurate indicating instruments for limited-space applications. Uniform scale, easily read to extreme accuracy.
Available in DC, rectifier and thermocouple types.

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The Standard of Quality for Forty Years

Precision made
to highest standards in the television industry . . .

TEI

THOMAS *offers engineers a challenge!*

Compare Thomas television tubes with any others on the market and see the difference! Twenty-eight separate tests are given Thomas cathode ray tubes before they leave the plant. Thomas has set the most critical examination to ensure the best. For the finest picture, use the finest tube — THOMAS!

THOMAS ELECTRONICS Inc.
118 Ninth Street — Passaic, New Jersey

Shurite
ELECTRICAL MEASURING INSTRUMENTS

RUGGED • ATTRACTIVE • MODERATELY PRICED

TYPES—ammeters, milliammeters, voltmeters, AC and DC. Resistance meters.

ACCURACY—well within 5%. AC meters are double-vane, repulsion type; DC meters are polarized-vane solenoid type.

CASES—three basic styles, round or rectangular, all requiring 2-5/32" hole. Zero adjuster available on some D.C. models. Also pocket types.

DIALS—all metal—age and moisture resistant. Special calibrations, one to five colors.

USES — plate current and voltage readings; battery charging and emergency lighting units; TV antenna rotator indicators; voltage regulators, etc.

STOCKED—by leading electronics parts distributors. Ask for Bulletin F-53-SH.

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The
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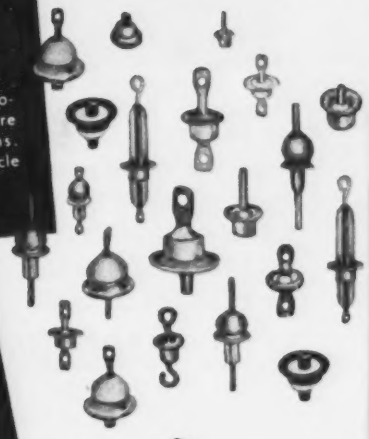
When buying, or requesting product information be sure to mention ELECTRONICS BUYERS' GUIDE.

Make E-I your HEADQUARTERS FOR ALL THREE!

Almost 100 standard sealed leads and multiple headers with a variety of optional features means E-I can solve your terminal problems quickly and at an economy price. For unusual applications, E-I engineers can design and produce exactly to your specifications. For a fast, practical solution on hermetically sealed terminals for critical electronic requirements, call an E-I engineer!

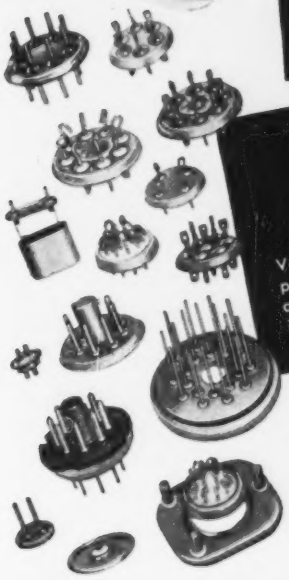
STANDARD SEALED LEADS

Made of hard glass preformed with microscopic air cushioning. Annealed to assure absolute freedom from thermal strains. Guaranteed to withstand U. S. Navy 5 cycle test.



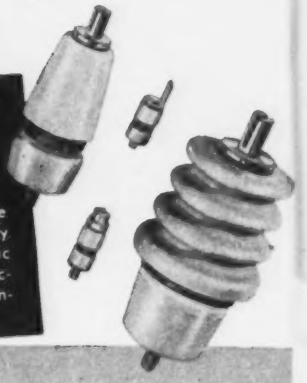
STANDARD MULTIPLE HEADERS

Vacuum tight headers with cushioned glass preforms, completely strain free, tin dipped and silicone treated in any optional features including CRT closures.



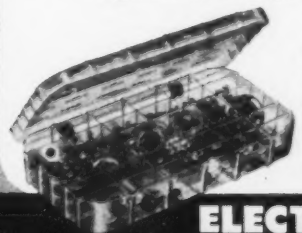
STANDARD GASKET TYPE BUSHINGS

Featuring high dielectric strength, resistance to mechanical and thermal shock and easy installation. Neoprene, hycar and selastic glands available. Meet all government specifications for sealed transformers and condensers.



Engineers, Designers, Purchasing Agents! Save time and effort

WITH THE E-I SAMPLE KIT!



New designers kit contains 81 standard terminals and 11 different headers. These mass produced, economy-priced standard parts solve practically all problems requiring hermetic sealing. Transparent case with labeled bins makes it easy to select the correct component for your needs. The E-I SAMPLE KIT is available at the nominal price of $10.00. Send check with order or request the free E-I illustrated brochure today!

ELECTRICAL INDUSTRIES • INC

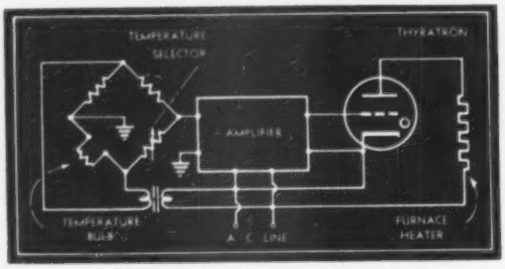
44 SUMMER AVENUE, NEWARK 4, NEW JERSEY

MANUFACTURERS OF SPECIALIZED ELECTRONIC EQUIPMENT

E-I INC

MACDONALD Proportioning Temperature Controller

Types A and 18B



CONTROLS temperature within 0.1°F

Available RANGES:

Controller Type A to 550 watts, 220V	$290
Controller Type 18B to 1650 watts, 220V	$375
Standard Bulb Type 18S to 1000°F	$ 40
Fast Response Bulb Type 18G —55 to +200°C	$ 75
Special Bulb Type 18W to 1000°C	$125

W. S. MACDONALD CO., INC.

CAMBRIDGE 38, MASSACHUSETTS

AMPERITE

THERMOSTATIC METAL TYPE

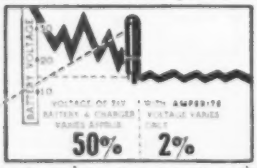
Delay Relays

PROVIDE DELAYS RANGING FROM 1 TO 120 SECONDS

FEATURES: — Compensated for ambient temperature changes from —40° to 110° F . . . Hermetically sealed; not affected by altitude, moisture or other climate changes . . . Explosion-proof . . . Octal radio base . . . Compact, light, rugged, inexpensive . . . Circuits available: SPST Normally Open; SPST Normally Closed.

PROBLEM? Send for *"Special Problem Sheet"*

Regulators



Amperite REGULATORS are the simplest, lightest, cheapest, and most compact method of obtaining current or voltage regulation . . . For currents of .060 to 6 Amps. . . . Hermetically sealed; not affected by altitude, ambient temperature, humidity.

Write for 4-page Illustrated Bulletin.

AMPERITE CO., Inc., 561 Broadway, New York 12, N. Y.

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This insignia

On your equipment indicates you are using the highest quality nuclear research and industrial instruments . . . instruments designed and built to perform — *reliably*

- Binary and decade scalers
- Plug in scaler strips
- Linear amplifiers
- Preamplifiers
- Scintillation counters
- Counting rate monitors
- Portable survey units
- Coincidence analyzers

Also regulated high voltage supplys, registers with electrical reset, high voltage AN connectors, industrial counting and batching equipment, etc.

Write for bulletins covering items in which you are interested or outline your requirements.

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Instrument Company

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FERRAMICS & CERAMICS
—for every requirement!

FERRAMICS

For smaller transformer or coil cores. Non-metallic. High efficiency. Inorganic and non-deteriorating. Excellent molding qualities and highest uniformity of structure. Reduce size and weight of components drastically and outperform other core materials volume for volume.

STEATITE LOW-LOSS INSULATORS

Efficient at all frequencies. High resistance to mechanical and thermal shock. Available in standard or custom shapes.

HERMETICALLY-SEALED TERMINALS

Tinned shoulders and lugs facilitate installation. Provide permanent seal. Rugged, immune to rough handling. All types.

ELECTRICAL PORCELAIN

For general electrical use. Unglazed white or glazed in white or brown. Inexpensive. Available in any shape or size.

WET PROCESS PORCELAIN

Meet all requirements for heavy or light duty and high or low voltage electrical applications. Highest quality.

For complete information on these products or for prompt estimates, call or write, without obligation.

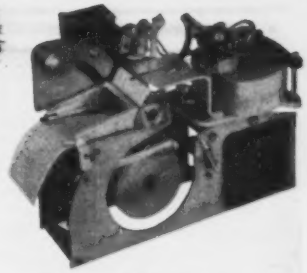
GENERAL

General CERAMICS and STEATITE CORP.

KEASBEY • NEW JERSEY

Makers of STEATITE, TITANATES, ZIRCON PORCELAIN, FERRAMICS, LIGHT DUTY REFRACTORIES, CHEMICAL STONEWARE, IMPERVIOUS GRAPHITE, COAXIAL CABLE

DIRECT WRITING RECORDERS

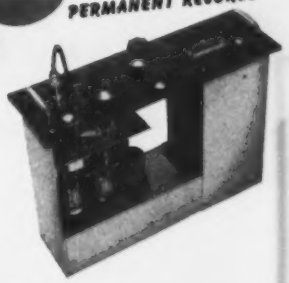


Records are produced by a heated writing stylus in contact with heat sensitive paper. The paper is pulled over a sharp edge in the paper drive mechanism (standard speed 25 mm/sec., slower available) and the stylus wipes along this edge as it swings, thus producing records in *true rectangular coordinates*. The writing arm is driven by a D'Arsonval moving coil Galvanometer with an extremely high torque movement (200,000 dyne cms per cm deflection).

This recorder assembly may be obtained in bare chassis form, as illustrated (51-600) with or without built-in timer; or, with the addition of a stylus heating transformer, temperature controls, and control panel (127); or, with the entire assembly, controls and control panel enclosed in a mahogany carrying case (127C). Complete catalog available, see below.

SINGLE CHANNEL — NO INK — RECTANGULAR COORDINATES — PERMANENT RECORDS

INSTRUMENT AMPLIFIERS



A general purpose, A.C. operated driver amplifier for use with model 127 Recorder, comprising three direct coupled push-pull stages. Maximum sensitivity 50 mv. per cm., minimum sensitivity 50 volts per cm., with four intermediate ranges. Balanced input terminals available with impedances of 5 megohms to ground. Complete information in catalog shown below.

Also Available:

High Sensitivity STRAIN GAGE amplifiers

AMPLIFIER-RECORDERS

Model shown at right is a single channel unit comprising above Amplifier 126 and Recorder 127, contained in one mahogany carrying case, and designed for use in the industrial field as a direct writing vacuum tube recording voltmeter capable of reproducing any electrical phenomena from the order of a few millivolts to more than 200 volts. More complete data in catalog shown below.

At lower right is a typical "Poly-Viso" multiple channel direct writing Recorder and Amplifier in console. Numerous combinations of this recording equipment and associated amplifiers and accessories are available. The Multi-channel Recorder (Model 65) provides for the simultaneous registration of *up to four* input phenomena, using the same principles and method as for the Recorder Assembly above. In addition, the "Poly-Viso" Recorder provides a selection of eight paper speeds: 50, 25, 10, 5, 2.5, 1.0, 0.5 and 0.25 mm/sec., and for the use of 4, 2, or 1 channel recording Permapaper. The Amplifier equipment is housed in a rack which has space for four individual driver amplifiers (electrically identical to model 126, above) and one 4-channel preamplifier.

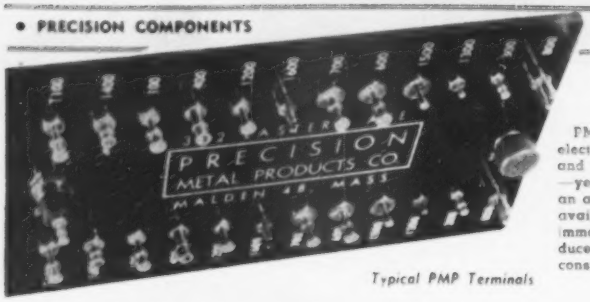
MULTI-CHANNEL — NO INK — RECTANGULAR COORDINATES — PERMANENT RECORDS

For complete catalog giving tables of constants, sizes and weights, illustrations, general description, and prices, address:

SANBORN COMPANY
Industrial Division
CAMBRIDGE 39, MASS.

Sanborn Recorders and Amplifiers have evolved from those originally designed by Sanborn Company for use in electrocardiographs, and have, by actual practice, proven to have wide applications in the industrial field as well.

• PRECISION COMPONENTS FOR THE ELECTRONIC INDUSTRY •

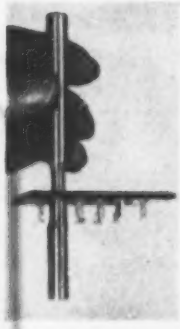


Typical PMP Terminals

PRECISION TERMINALS

PMP designs and fabricates terminals for every conceivable electronic requirement. Their unusual production methods and engineering skill provides products of far better quality —yet at costs below competition. Base material is brass with an approved silver plated finish. Centrifugal tin dipped finish available at no extra cost. Their standard line is available immediately and specially designed terminals can be produced within any reasonable requirement. Before you buy consult PMP.

HAND SWAGGING TOOLS



Precision hand swagging tools are correctly designed for fast smooth assembly of terminals into terminal board. They are made of tool steel and tempered for long life. For production, they can be used in a standard kickpress.

PMP also furnishes bench type swaggers

SPECIAL TERMINAL ASSEMBLIES

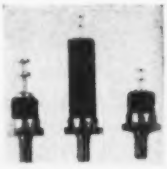
PMP has fabricated thousands of special terminal assemblies and mounting boards for manufacturers of electronic equipment to meet rigid military and industrial requirements. Any type of material or marking can be furnished. Wax and fungicidal treatment in accordance with specifications.

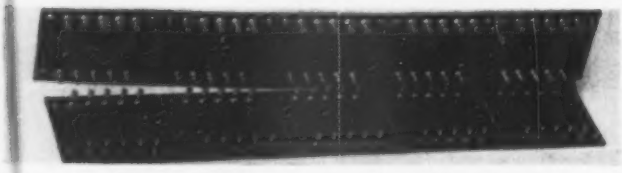
TUBULAR TURRET TERMINALS

PMP Tubular Turret terminals permit mounting of components on both sides of a terminal board. Where compactness is necessary these tubulars have found wide use in electronic circuitry.

INSULATED STAND-OFF TERMINALS

PMP insulated stand-off terminals are engineered and manufactured to the highest specifications. The insulating material is Grade XXX phenolic. Bases are nickel plated brass and are furnished in 2 types: Threaded or riveting. Terminals are silver plated.





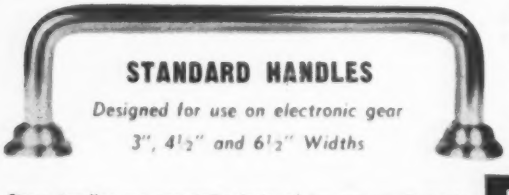
STANDARD UNIVERSAL SECTION BOARDS

Precision universal section boards have met with enthusiastic approval. Engineers, Laboratory Technicians, and Designers find it invaluable as a low cost aid in development and prototype work.

Available in 4 widths, each board has 5 sections, complete in itself, with 10 terminals and 4 mounting holes. One or more sections can be easily separated to suit a particular job. PMP offers a choice of 2 terminal types: No. 100 (Double Turret) or No. 400 (Tubular Turret). Also choice of board material: LE or XXX phenolic. XXX phenolic as board material has found wide acceptance and use in high frequency applications.

SECTION SCORING

The illustration above clearly shows the ease with which one or more of the five sections of the PMP Universal Board may be used. The scoring is deep enough to make a clean break but not too deep to remain rigid if all five are used.



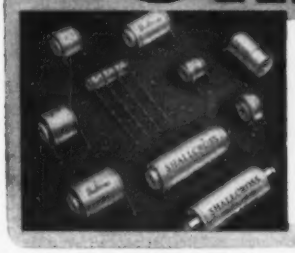
These handles are especially designed for use on electronic equipment of all types. Handles are furnished in electro-polished stainless steel and hand buffed nickel plated brass. Matching ferrules which add much to rigidity and appearance can be furnished with handles or separately.

PRECISION HARDWARE: Many items in the Electronic Hardware field, such as handles, ferrules, thumb screws, stand-offs, etc., are kept in stock. Many years of experience in all types of metal fabrication, enables PMP to offer manufacturers a specialized service in the designing and production of custom components. Quality and PMP are synonymous, and production "Know-how" has kept PMP prices down with the lowest.

FOR COMPLETE DATA & PRICES on all PMP products send for Catalog No. 20. Requests on company letterhead promptly answered.

PRECISION
METAL PRODUCTS CO.
OF MALDEN
342 Eastern Ave. Malden, Mass.

SHALLCROSS

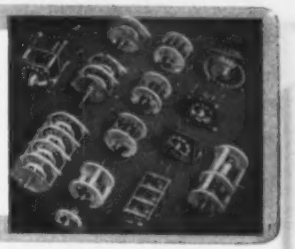


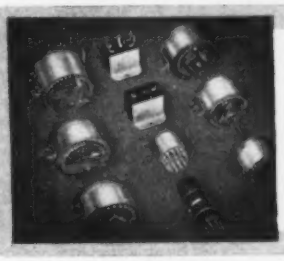
AKRA-OHM PRECISION RESISTORS

Not only are Shallcross Akra-Ohm wire-wound precision resistors made to extremely close tolerances; equally important, they are physically protected to maintain their accuracy under difficult operating conditions. Types, shapes, sizes, and mounting styles for JAN and other exacting needs. Guaranteed tolerances from 0.1% to 0.02% and stabilities as low as 0.003% where required. Matched pairs and sets available. Write for Shallcross Resistor Bulletin R3A.

MULTI-POSITION SELECTOR SWITCHES

Shallcross regularly manufactures a wide variety of single or multi-deck selector switches having up to 180 positions and designed for dependable performance up to 250 volts 10 amperes or 2500 volts 1 ampere A.C. Contact resistance ranges from a low of 0.0005 ohms to a maximum of 0.005 ohms depending upon the size and material of the contacts. Outline your requirements on Specification Sheet No. 6 for recommendation. Write for Data Bulletin L13.





PRECISION ATTENUATORS

Improved materials and production techniques and careful quality control for Shallcross Attenuators have resulted in a line that sets new, higher standards of attenuation performance for practically every audio and communications use. Included are single and dual potentiometers, variable impedance matching networks, V. U. meter multipliers, cueing attenuators, fixed pads, pre-emphasis and de-emphasis networks, attenuation boxes, ladder and balanced ladder controls, and bridged T, straight T, bridged H, and straight H attenuators. Write for Attenuator Bulletin 4.

PRECISE MEASURING INSTRUMENTS

As long-time specialists in standard and special electrical measuring instruments, Shallcross welcomes your inquiry for any desired type. Standard instruments include:

Resistance Standards • Decade Potentiometers • Decade Resistance Boxes • Bridges, Wheatstone • Bridges, Kelvin-Wheatstone • Bridges, Limit • Bridges, Megohm • Capacitor Analyzers • Decibel Meters • Tone Generators • Telephone Test Equipment • Low-Resistance Test Sets • Insulation Test Sets • High-Voltage Test and Measuring Equipment

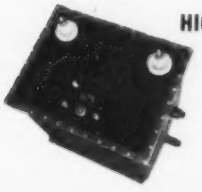
Write for Shallcross Bulletin 10

HI-MEG, HI-VOLTAGE RESISTORS

Special resistance elements hermetically sealed in ceramic tubes with ferrule terminals. Three standard sizes offer values to over 100 megohms. Write for Bulletin F.

HERMETICALLY-SEALED NETWORKS

Resistance, capacitance, bridge and inductance types available to meet critical electrical specifications and space requirements. Outline details of your requirements for recommendation by Shallcross Engineers.



HIGH-RANGE KILOVOLTMETER MULTIPLIERS

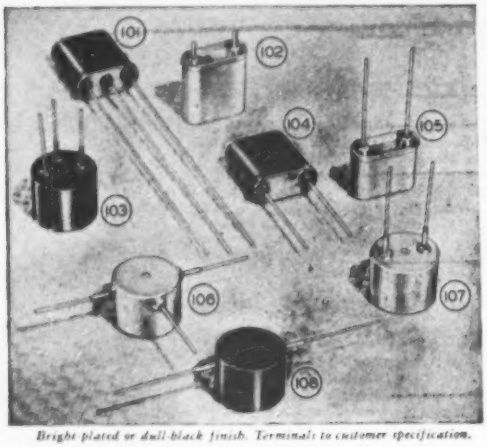
Whether for direct high-voltage measurements or for use as standards, Shallcross KV meter multipliers combine close accuracy with safety and dependability. Various types are available for voltages up to 200,000 volts or higher if required. Write for Bulletin F.

CUSTOM-BUILT SPECIALTIES AND ENGINEERING SERVICE

Sealed networks, high voltage measuring equipment, special test sets, thermally controlled networks, precise decades and networks for computer devices, high resistance standards, and critical coil assemblies are designed by Shallcross Engineers and built to meet your requirements. Forward your specifications for further information.

SHALLCROSS MANUFACTURING CO., Dept. EG-60 Collingdale, Pa.

STEVENS HERMETICALLY SEALED THERMOSTATS

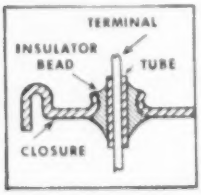


Bright plated or dull black finish. Terminals to customer specification.

- **fast response**
- **close control**
- **operation from -60° to 600°F**
- **dust, moisture and explosion-proof**

Specially engineered for precision control of radio and electronic devices, instruments, cameras and other equipment subjected to dust, moisture or corrosive atmospheres, Stevens hermetically sealed thermostats are enclosed in corrosion-resistant metal cans.

Carefully precalibrated in pots simulating your actual service conditions, Stevens* hermetically sealed thermostats have a tight, permanent seal that *prevents deterioration or sulphiding of contacts.* They can also be sealed in helium or other inert gas atmosphere. Terminals are sweat-soldered into inert alloy tubes interfused with inorganic glass insulator bead.



Stevens hermetically sealed thermostats—featuring an electrically independent bi-metal element that eliminates artificial cycling or life-shortening "jitters"—are available in disc types for controlling higher-wattage circuits, or in strip types for controlling low-wattage circuits or for use in conjunction with disc thermostats.

To insure the satisfactory performance of your product, specify Stevens hermetically sealed thermostats—*they perform better . . . last longer.* A-2114

*Stevens also makes a complete line of semi-sealed and standard bi-metal disc and strip thermostats. Write for data.

STEVENS *manufacturing company, inc.*
MANSFIELD, OHIO

1,000,000

¼ watt resistors for only $15*

CONDUCTING, RESISTANCE, MAGNETIC PAINTS AND HOT MELTS

A REMARKABLE GROUP of relatively new engineering materials designed to SAVE manufacturing TIME and drastically REDUCE COST in EVERY BRANCH of the electrical industry.

USE of these materials in complete PRINTED CIRCUITS is increasing. SPECIAL APPLICATIONS involving single areas and lines of conducting, resistance, and magnetic paints are effecting tremendous savings in time and money on standard equipment. Our S21 KIT described below will enable you to locate those applications in your equipment. Applications include shielding, corona and static elimination, inductance adjustment, heating, wire and resistor replacement, and many others. (See our "Industrial Electronic Coatings" bulletin below.)

APPLICATION may be by any method used with conventional coatings. Square resistances from hundredths of an ohm to thousands of megohms can be produced. Flexibility, drying rate, and other properties may be specified.

For RESEARCH DEVELOPMENT EXPERIMENTATION

Order our S21 KIT of five air-drying conducting and resistance paints plus solvent and lacquer. Fifteen day inspection period. $7.27, postpaid in U.S.A., or from your local distributor.

For further information write for your copies of:

Here is the Story	Free
Industrial Electronic Coatings	Free
Printed Circuit Design Outline	Free
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* $15.00 is the total cost of the resistance paint required to replace conventional resistors in this use. This is a case where a painted-on resistor is saving a manufacturer many hundreds of dollars and reducing size and weight in his equipment.

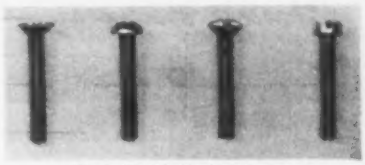
MICRO-CIRCUITS COMPANY
Coatings Dept.
NEW BUFFALO, MICHIGAN

FASTENINGS for every need in electronic gear

When you make Blake & Johnson your headquarters for small fastening devices, you benefit by more than a hundred years of manufacturing know-how. Since 1849, Blake & Johnson has been recognized as a dependable, one-stop source for all types of fasteners—in steel, stainless steel, copper, brass, bronze, everdur, nickel, nickel silver, monel, and aluminum.

STANDARD MACHINE SCREWS

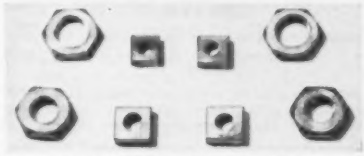
Blake & Johnson Standard Machine Screws are available in flat, round, oval, fillister, hexagon, binding, pan, truss and unslotted (special) heads. Threads per inch range from 16-64; lengths, ⅛"-3". In steel or brass.



Typical B.&J. Machine Screws

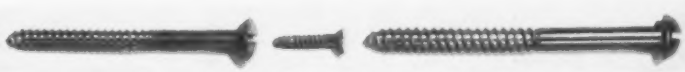
MACHINE SCREW NUTS

Manufactured in steel or brass with coarse (16-56) and fine (24-64) threads. Width across flats—3/16" to ⅝". Hexagon or square. Nuts may be plated in nickel, brass, copper, cadmium, electro-galvanizing or zinc plate, bluing and parkerizing. Special finishes also available.



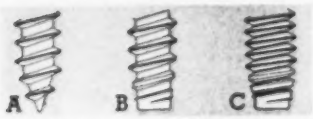
Typical B.&J. Machine Screw Nuts

TWIN-FAST WOOD SCREWS



A twin thread screw for faster production—stronger fastening. Twin-Fast screws present 4 major improvements: 1. *Relieved Shank Diameter*—eliminates danger of setting up stresses that causes fractures or ruptures, assures perfect alignment. 2. *Twin Threads*—provide greater thread pitch. Cuts fastening time in half. 3. *Cylindrical Construction*—provides greater strength—more thread area. Holding power far exceeds that of ordinary tapered screws. 4. *Single, Centered Point*—specially designed twin threads terminate in a single, centered point where the two cutting blades meet. Screw bites into wood at first pressure and drives straight.

TAPPING SCREWS



Available in three types shown above with flat, round, oval, truss, pan and hexagon heads. ⅛" to 2" in length with either plain or plated finish. Threads per inch range from: Type A, 32-9; Type B, 32-12; Type C, 24 to 40. Thread angle 60° included.

SPECIAL WIRE FORMS

Typical of our manufacturing versatility is a line of special forms, for diverse industries, made from ferrous and non-ferrous wire, in such shapes as bent wires, threaded rods, eye bolts, "U" bolts, dowels, winder keys, and many others.

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Our long manufacturing experience has made the company name and the term "Cold Heading Specialists" synonymous. In addition to our regular line of standard screws and bolts, production items of irregularly shaped heads are made special-to-order.

PHILLIPS HEAD Blake & Johnson standard machine screws, Twin-Fast wood screws, and tapping screws are available with Phillips head. They are manufactured in the various shape heads mentioned above and are either plain or plated finish. Metals include brass and steel.

FASTENERS TO SPECIFICATIONS

Our engineers are always glad to work with yours to help select or develop the fastening that provides quickest application, greatest holding power and soundest economy for your particular needs.

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The Blake & Johnson fastenings catalog is complete in every detail — includes extensive technical information and prices. Send request on your company letterhead. Address Dept. G.

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SHORT CIRCUIT and OVERLOAD PROTECTION

Fully Electro-Magnetic Circuit Breakers—Instantaneous and Time Delay Types

Typical Wiring Diagrams

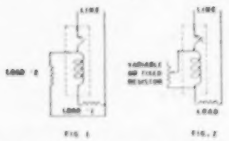

FIG. 1 FIG. 2

CALIBRATING TAP

Figure 1 illustrates two separate loads wired to a single pole calibrating tap Circuit Breaker. Both load #1 and load #2 are disconnected when an overload occurs in load #1.

Figure 2 illustrates the use of a variable or fixed resistor in parallel with the trip coil to gain an adjustable variation in the rating or different fixed ratings giving a wide range of calibration of the tripping point.

Innumerable combinations can be obtained by use of 2 and 3 pole Circuit Breakers.

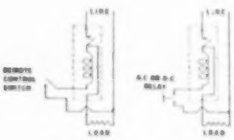

FIG. 3 FIG. 4

SHUNT TRIP

Figure 3 illustrates a shunt trip Circuit Breaker that can be tripped at some remote station.

Figure 4 illustrates a shunt trip Circuit Breaker that can be operated by an AC or DC relay operating a set of contacts upon which the line voltage is impressed.

These Circuit Breakers must be reclosed manually.

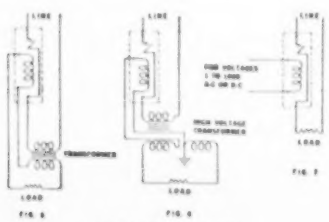

FIG. 5 FIG. 6 FIG. 7

RELAY TRIP

Figure 5 illustrates a relay trip Circuit Breaker protecting a transformer by limiting the current in the secondary. When the Circuit Breaker is tripped the primary of the transformer is open circuited.

Figure 6 illustrates a relay trip Circuit Breaker protecting a high voltage transformer by having the relay coil inserted between the two secondary windings at the grounded terminal. When the Circuit Breaker is tripped the primary of the transformer is open circuited.

Figure 7 illustrates a relay trip Circuit Breaker operated by an independent source of current, either AC or DC, and for voltages of 1 to 1000.

Circuit Breakers

in ratings from 50 milliamperes to 50 amperes operating on circuits to 460 volts AC or 250 volts DC.

1 Pole Breaker

A complete line of circuit breakers furnished in both Instantaneous Trip and Time Delay types. The former trips instantly on short circuits and sudden overloads, opening the circuit even before an ammeter could indicate the amount of current.

The Time Delay Type also opens instantly on short circuits but eliminates unnecessary opening of the circuit on harmless overloads of short duration—such as that caused by inrush current when starting motor.

2 Pole Breaker

Time delay breakers are available in any one of 3 inverse time delays that match the characteristics of almost any circuit. The magnetic trip unit is hermetically sealed to prevent tampering. All breakers are calibrated, set and adjusted at the factory.

These breakers are available in single, two and three pole designs as illustrated; bakelite enclosed or in steel cabinets or explosion proof housings.

3 Pole Breaker

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Chicago Transformer's New Equipment Line offers transformer engineering *ahead* of the trends in circuit design. It's the Transformer Line preferred by experts in the P.A., ham, communication and experimental fields, and by broadcast stations and manufacturers.

Check these features—*drawn steel cases* to provide compact, streamlined mounting; *conservative ratings* that meet all RMA and FCC recommendations; *precision characteristics* for stable, uniformly excellent performance—these, and many others. Check the prices—and you'll learn how little more these advanced units cost over conventional transformers.

Typical of the New Equipment Line are the outstanding audio transformers listed below. Get full details on the complete line—write for descriptive catalog today.

No. BO-6
List Price $23.00

Response within .2db, 30 to 20,000 cycles

New Full Frequency Range Output Transformer

No. BO-6. For use in high fidelity amplifiers. Couples push-pull 6L6's (7500 ohms, C-T) to 6/8 or 16/20-ohm voice coil. Center-tapped tertiary winding provides 15% inverse feedback to reduce harmonic distortion to a minimum. In drawn steel case, $4\frac{3}{16}$" x $3\frac{7}{8}$" x $3\frac{11}{16}$", with mounting studs and pin-type terminals.

There's a CHICAGO OUTPUT TRANSFORMER For Every Full Frequency Use

Cat. No.	Application	Impedance	Max. Power	List
BO-1	Single Plate to Line	Pri.—15,000 ohms at 0 to 10 ma d-c *Sec.—600/150 ohms CT	+20 dbm	$13.00
BO-2	P.P. Plates to Line	*Pri.—20,000 ohms CT *Sec.—600/150 ohms CT	+30 dbm	19.00
BO-3	P.P. Plates to Line	Pri.—5,000 ohms CT *Sec.—600/150 ohms CT	+40 dbm	17.00
‡BO-4	P.P. Plates to Line	Pri.—7,500 ohms CT *Sec.—600/150 ohms CT	+43 dbm	18.00
BO-5	P.P. Plates to Line	Pri.—10,000 ohms CT *Sec.—600/150 ohms CT; 16/8/4 ohms	+37 dbm	24.00

‡Tertiary winding provides 15% inverse feedback. *Split and balanced windings.

New
Catalog Line of
HERMETICALLY SEALED TRANSFORMERS

Meet All JAN-T-27 Requirements

A complete range of power, bias, and filament transformers, and filter reactors, that meet all Grade I "JAN" tests for Class A operation. Famous CHICAGO "Sealed in Steel" constructions with bushing gasket terminal seals. If you are in military research work, be sure to write for complete details on this advanced line.

Television Transformers *to fit today's leading TV circuits*

Because Chicago Transformer is the largest single supplier of transformers to the Television industry, you gain the advantages of "Original Equipment" components when you buy Chicago TV Transformers. Available now, the three units described here are part of a complete new line, soon to be announced.

Vertical Blocking Oscillator Transformer No. TBO-1. 60-cycle unit for creating the vertical sweep "saw-tooth" voltages required in conventional circuits.

Pri. Inductance: 1.15 hy ± 20% at 3 v., 1000 cycles
Pri. Leakage Inductance: 8 mh + 25%, −15%
Ratio, Primary to Secondary: 1 to 4.2

Exact equivalent to R. C. A. Part No. 20BT2.

TV Power Transformer No. TP-365. Designed to supply 405 volts d-c with two 5U4G's to an 80 mfd condenser input. Copper shorting band around core reduces external magnetic field; cuts image distortion to a minimum.

Pri., 115 v., 60 cycles — Fil. No. 1: 12.6 v., 5 amps, C-T
H.V. Sec.: 362-0-362 v., d-c, .295 amps d-c — Fil. No. 2: 5 v., 2 amps
Fil. No. 3: 5 v., 6 amps

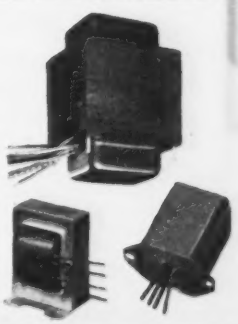
Exact equivalent to R. C. A. Part No. 20IT6.

Vertical Scanning Output Transformer No. TSO-1. Couples vertical output tubes to picture tube deflection yoke.

Pri. Impedance: 19,000 ohms at 30 v., 60 cycles, 13 ma d-c
Ratio, Primary to Secondary: 10 to 1

Exact equivalent to R. C. A. Part No. 20AT2.

Write for Descriptive Literature



CHICAGO TRANSFORMER
DIVISION OF ESSEX WIRE CORPORATION
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Stock Molded KNOBS

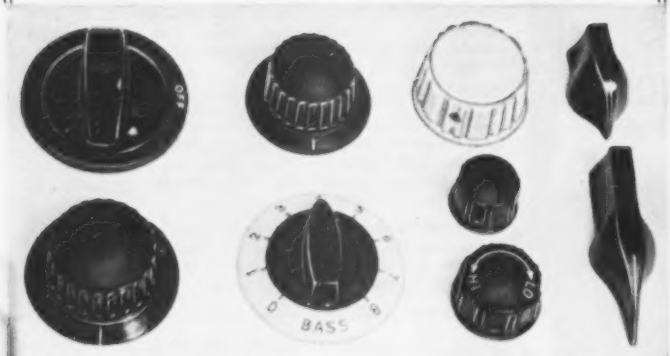

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Illustration shows just a few of the many stock molded knobs available from Rogan's huge selection. Supplied without tool charge, ready for immediate delivery. Saves you time and money. Wide range of sizes, shapes, colors. Can be branded to specifications. Write for catalog now!

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Make BETTER Soldering *EASIER*

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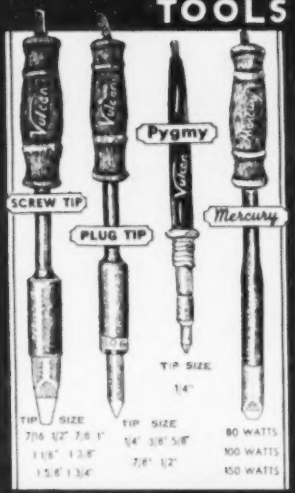
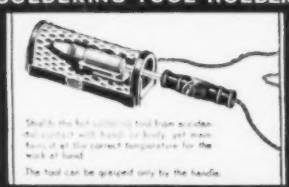
ELECTRIC SOLDERING TOOLS



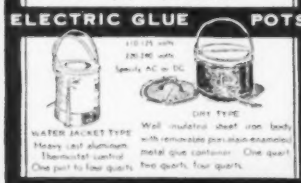
SOLDERING TOOL HOLDER



Shields the hot soldering tool from accidental contact with clothing or body, yet maintains it at the correct temperature for the work at hand.

The tool can be grasped only by the handle.

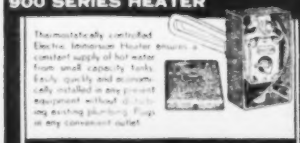
ELECTRIC GLUE POTS



Heavy cast aluminum. Thermostat control. One pint to four quarts.

Wall insulated sheet iron body with removable porcelain enameled metal glue container. One quart, two quarts, four quarts.

900 SERIES HEATER



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Constant-Impedance Output Attenuator	111
Flexible Resistors (Glasohms and Flexohms)	105
General Information	101
General Utility or Accessory Resistors	125
Greenohm Jr. (Midget Power Resistors)	110
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Wire-Wound Standard Controls	118
Synchronous Motors (for clocks, etc.)	144

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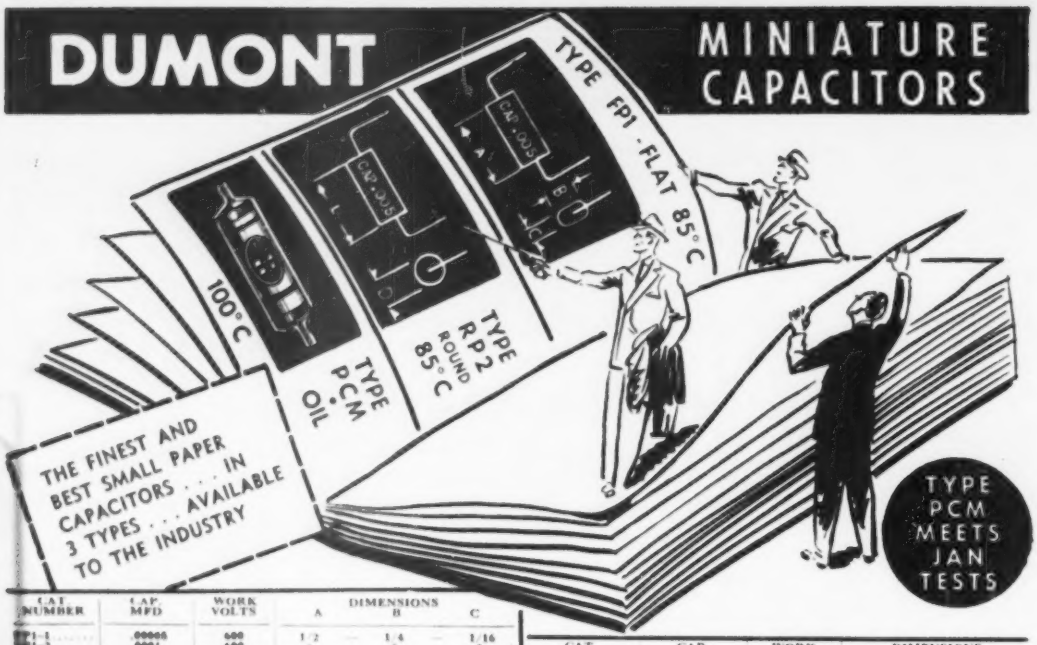
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TYPE PCM MEETS JAN TESTS

CAT. NUMBER	CAP. MFD	WORK VOLTS	DIMENSIONS A	B	C
PP1-1	.00005	600	1/2 —	1/4 —	1/16
PP1-2	.0001	600	"	"	"
PP1-3	.00025	600	"	"	"
PP1-4	.0005	600	"	"	"
PP1-5	.001	200	"	"	"
PP1-6	.001	600	1/2 —	3/8 —	1/16
PP1-7	.002	200	1/2 —	1/4 —	1/16
PP1-8	.002	600	1/2 —	1/4 —	1/8
PP1-9	.002	200	"	"	"
PP1-10	.005	600	5/8 —	3/8 —	1/8
PP1-11	.005	200	"	"	"
PP1-12	.01	200	1/2 —	3/8 —	1/8
PP1-13	.01	600	5/8 —	3/8 —	1/8
PP1-14	.01	600	"	"	"
PP1-15	.02	200	"	"	"
PP1-16	.02	600	5/8 —	3/8 —	3/16
PP1-17	.02	600	"	"	"
PP1-18	.03	200	5/8 —	5/8 —	1/8
PP1-19	.03	600	3/4 —	3/8 —	1/4
PP1-20	.03	600	"	"	"
PP1-21	.05	200	5/8 —	3/8 —	3/16
PP1-22	.05	200	3/4 —	3/8 —	1/8
PP1-23	.05	600	3/4 —	1/2 —	3/16
PP1-24	.05	600	"	"	"
PP1-25	.1	200	3/4 —	3/8 —	1/8
PP1-26	.1	200	3/4 —	5/8 —	1/4
PP1-27	.1	600	3/4 —	5/8 —	3/8
PP1-28	.25	100	"	"	"
PP1-29	.25	200	"	5/8 —	5/16
PP1-30	.25	600	1 1/4 —	5/8 —	3/8
PP1-31	.5	100	1 1/2 —	1/2 —	1/8
PP1-32	.5	200	1 1/2 —	5/8 —	1/4
PP1-33	.5	600	1 1/2 —	1 —	5/8
PP1-34	.5	600	1 1/2 —	1 —	5/8
PP1-35	1.0	50	1 1/2 —	5/8 —	3/8
PP1-36	1.0	100	1 1/2 —	1 —	5/8
PP1-37	1.0	200	1 1/2 —	1 —	1
PP1-38	1.0	400	1 1/2 —	1 —	1
PP1-39	2.0	50	1 1/2 —	7/8 —	3/8
PP1-40	2.0	100	1 5/8 —	1 —	5/8
PP1-41	4.0	50	1 5/8 —	1 1/8 —	7/8
PP1-42	4.0	100	1 5/8 —	1 1/4 —	1
PP1-43	4.0	200	1 5/8 —	1 1/2 —	1
PP1-44	4.0	400	1 5/8 —	1 1/2 —	1
PP1-45	6.0	50	1 5/8 —	1 1/2 —	1

CAT. NUMBER	CAP. MFD	WORK VOLTS	DIMENSIONS LENGTH	DIAMETER
RP2-1	.00005	600	1/2 —	3/16
RP2-2	.0001	600	"	"
RP2-3	.00025	600	"	"
RP2-4	.0005	600	"	"
RP2-5	.001	200	"	"
RP2-6	.001	600	1/2 —	1/4
RP2-7	.002	200	1/2 —	3/16
RP2-8	.002	600	5/8 —	1/4
RP2-9	.003	200	1/2 —	3/16
RP2-10	.003	600	1/2 —	1/4
RP2-11	.005	200	5/8 —	3/16
RP2-12	.005	600	5/8 —	1/4
RP2-13	.005	600	"	"
RP2-14	.01	200	"	"
RP2-15	.01	600	3/4 —	1/4
RP2-16	.01	600	"	"
RP2-17	.02	200	"	"
RP2-18	.02	600	3/8 —	3/8
RP2-19	.02	600	"	"
RP2-20	.03	200	"	"
RP2-21	.03	600	"	"
RP2-22	.05	600	"	"
RP2-23	.05	600	3/4 —	1/2
RP2-24	.075	200	3/4 —	3/16
RP2-25	.1	200	3/4 —	3/8
RP2-26	.25	200	1 —	3/8
RP2-27	.5	200	1 1/2 —	1/2
RP2-28	1.0	100	1 1/2 —	3/4
RP2-29	2.0	100	1 1/2 —	1

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CAT. NUMBER PCM PBM	CAP. MF.	100 V D X L	CAT. NUMBER PCM PBM	200 V D X L	CAT. NUMBER PCM PBM	400 V D X L
1	.0001	3/16 — 1/2	21A	3/16 — 1/2	41A	1/4 — 7/8
2	.00025	" "	22	" "	42	" "
3	.0005	" "	23	" "	43	" "
4	.001	" "	24	3/16 — 7/8	44	" "
5	.002	" "	25	3/16 — 7/8	45	" "
6	.003	" "	26	" "	46	" "
7	.004	" "	27	" "	47	5/16 — 7/8
8	.005	" "	28	" "	48	" "
9	.01	3/16 — 7/8	29	1/4 — 7/8	49	" "
10	.015	" "	30	" "	50	" "
11	.02	1/4 — 7/8	31	5/16 — 7/8	51	3/8 — 7/8
12	.025	" "	32	" "	52	7/16 — 7/8
13	.03	5/16 — 7/8	33	" "	53	1/2 — 7/8
14	.04	" "	34	1/2 — 7/8	54	9/16 — 1 1/8
15	.05	3/8 — 7/8	35	" "	55	5/8 — 1 1/8
16	.1	7/16 — 7/8	36	1/2 — 1 1/8	56	" "
17	.15	1/2 — 1 1/8	37	5/8 — 1 1/2	57	5/8 — 1 1/2
18	.2	9/16 — 1 1/8	38	" "	58	" "
19	.25	" "	39	" "	59	11/16 — 2
20	.5	5/8 — 1 5/8	40	5/8 — 2	60	3/4 — 2
21	1.0	3/4 — 1 5/8	41	3/4 — 2	61	3/4 — 3

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A-10 is an unusually high grade vinyl insulating compound developed in our own laboratories for a better hook-up wire. It has excellent resistance to deformation, soldering, high temperature, low temperature and aging; high electrical properties; Underwriters Lab. approved for continuous operation to 105°C without fibrous covering.

JAN-C-76 HOOK-UP WIRE

Approval includes all types (WL—SRIR—SRHV—SRRF) in all sizes. WL available with nylon jacket or glass braid. SRIR—SRHV—SRRF available with primary insulation only or with the addition of a glass braided covering. All standard colors including "Spiralon" spiral striping.

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"Surprenant" manufactures an extensive line of multi conductor cables for a variety of applications with conductor sizes from No. 32 AWG stranded and larger, with or without nylon jacket or shielding.
Our "Spiralon" color coding system permits easy identification even when hundreds of conductors are involved.
Our designs and close tolerances permit unusually small overall diameters.

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"Surco" coaxial cables include a wide variety of types, such as, low capacity, extra flexibility, small diameter, michrophone and 2 conductor. Many approved and conformed to Jan-C-17A. Many special designs. If you have a coaxial cable problem consult us.

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"Surflon" (tetrafluoroethylene) insulation is extremely stable and capable of operation at 200 C for long periods with no appreciable decomposition. Non-inflammable. High resistance to chemicals; has no known solvent. Volume and surface resistivity very high. Surflon's electrical losses are exceptionally low, which adapts it for use on high frequency applications over a wide range of temperatures. Now available in hook-up wire sizes.

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"Surco" vinyl tubing is available in special formulations for particular applications, such as, low temperature (-65°C), high temperature (105°C), U.L. approved, high dielectric strength, extreme flexibility and colors, as well as, standard compounds which are carried in stock in regular sizes. Polyethylene and nylon tubing are also available and are carried in stock in natural color, in limited sizes.

"SPIRALON"

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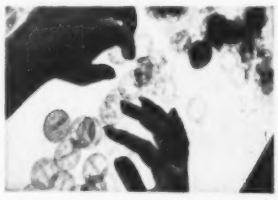

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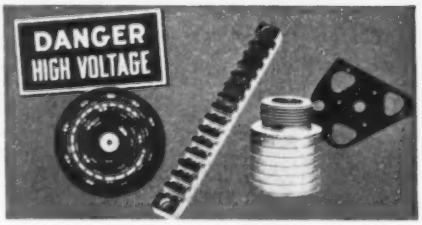

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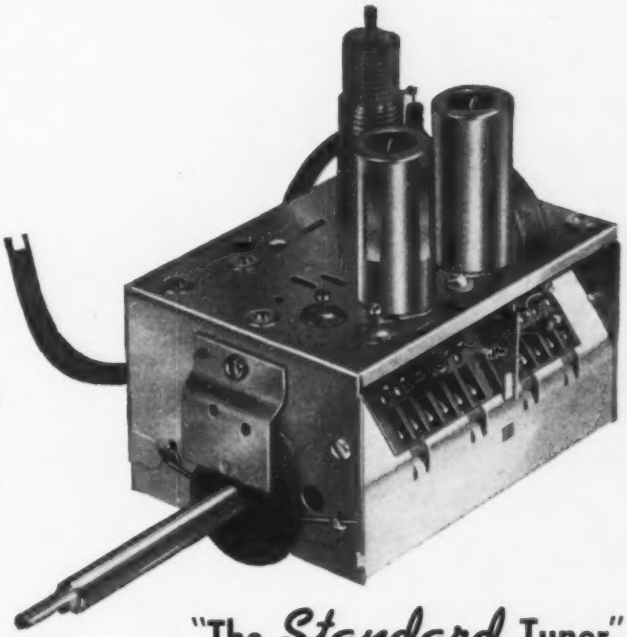

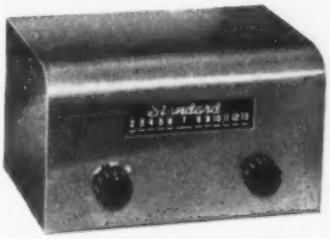

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This directory illustrates some of these products, and is our invitation to you to work with us in this new field of ENGINEERED CONNECTIONS, whether for cables or plug-in unit construction.

Connectors that Pack Greater Performance, Higher Quality into Less Space at Lower Cost

Engineers, production men and purchasing agents are now realizing that in the Alden connectors below, they've got the only top

connected contacts that provide long protective molded insulation around each clip and lead — that grab the wire tip for strain relief — and mechanically hold wire tips so they cannot be imperfectly soldered.

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Pioneers in cathode ray tube connectors — tricon, duo-decal, diheptal — meet highest standards for gov't., instrument or TV work.

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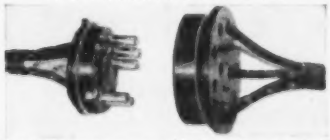

Multiwire connectors with 2 to 11 contacts in variable pin layouts — prevents mis-mating.

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Speaker plugs and cable connectors 2 to 7 contacts — UL collars — Top Engineering.

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Most compact connector for AC current or signal — 2 to 4 contacts.

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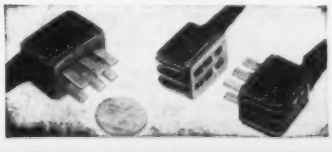

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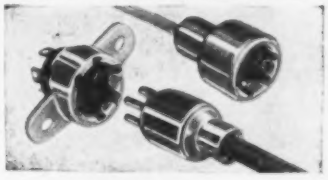
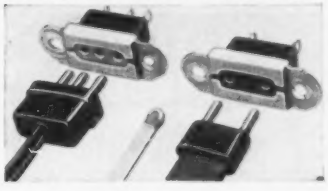


HA SERIES Miniature Antenna Series



Simple, Rugged Dial Lights

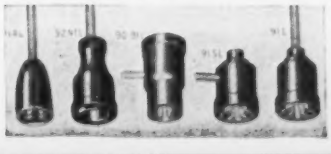
with exclusive NA-ALD "center file" contacts, which hold each strand of wire tip against

bulb base — for cutting through corrosion — crimps around wire insulation for strain relief.

80 SERIES

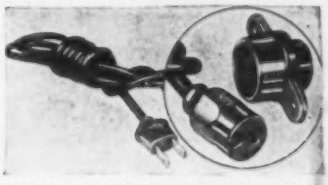
Tube Caps for Every Need

90 SERIES



Detachable Line Cords

202 FAC SERIES



Complete line of high quality detachable line cords — harmonize with deluxe equipment. "Trip," "click" or shielded locking line cords can meet your every requirement.

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Complete line of fuseholders for all fused equipment. Also new miniature indicator fuse for gov't. work.

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Rivet or eyelet to chassis takes less than 1" space behind panel. Several types available.

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Components for Plug-in Unit Construction

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In a whole new series of components Alden presents:

- Slide-in, lock-in chassis—miniature and all sizes so chassis are easily accessible for checking or replacement.
- Back Connectors — for industrial or electronic equipment.
- Plug-in Bases and Housings — specifically designed to meet demands of plug-in unit construction.
- Quick locking and ejecting devices — for clamping and holding plug-in units.

Let Alden work with you on components for plug-in unit construction.

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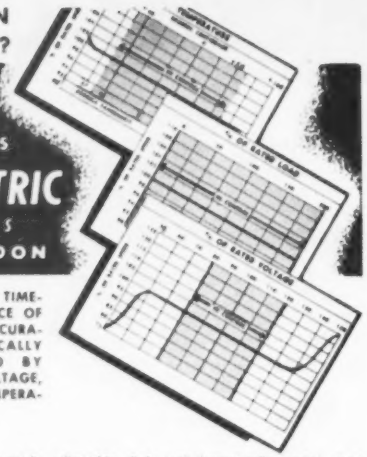

TIME DELAY RELAYS—Single and multiple switch, adjustable dial, and hermetically sealed, both A.C. and D.C.

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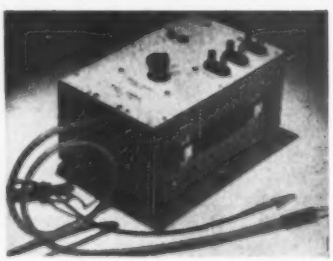

HIGH INPUT IMPEDANCE DEVICE

MODEL 102 An Instrument amplifier with 200 mgs— 6.5 mmf input impedance

Used singly or together, bridges voltmeters and cathode ray oscilloscopes, which have inputs of 1 megohm and 30 mmf, onto signal circuits of 50,000 ohms and higher—such as a pentode amplifier stage with its high resistance plate load—without the usual loss of voltage and high frequency response which would result if the measuring instruments were connected directly. Input impedance: 200 megohms shunted by 6.5 mmf. Output impedance: 300 ohms. Gains of 1.00, 10.0, and 100. Frequency Range from 5 cps to 150,000 cps within 2%. Background noise equivalent to 40 to 70 microvolts at the input.

Other Keithley Instruments:

SIGNAL DIVIDER Model 101 . . .

An attenuator designed to provide low level input signals used in testing high gain amplifiers. Conventional signal sources have outputs which can be varied to a minimum of about 0.1 v. Used to extend range downward; it attenuates in decade steps, and used in conjunction with output control of signal source, makes possible accurate, controllable, and convenient adjusted test signal voltages from about 10 μv to 100 v.

VOLTAGE DIVIDER Model 103

Accessory for Model 102. Extends working range of input signals from 10 v rms, with sinusoidal wave forms, to signals whose peak ac plus dc potentials are 600 v.

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RECORDING GALVANOMETERS

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World's Largest Manufacturer of Geophysical and Special Galvanometers

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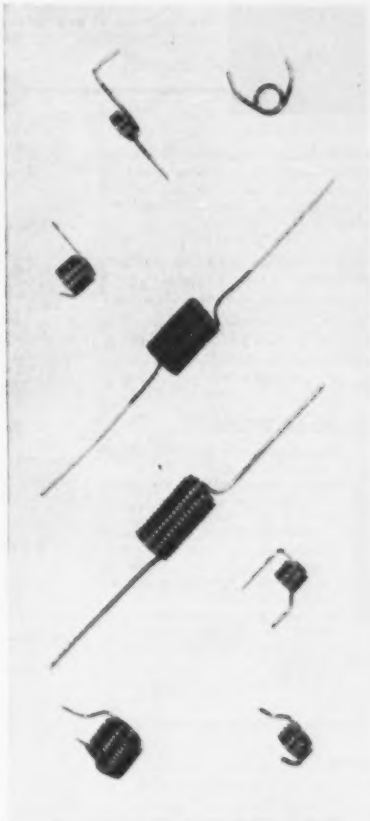

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. . . with its complete and modern plant, expertly trained personnel, and production "know-how", supply the foremost television manufacturers with channel, filament choke, contact, and band-tuning coils, as illustrated here.

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WHY NOT AVAIL YOURSELF of WEBSTER'S experience, which makes possible the quantity production of these coils at the most economical level consistent with high quality standards.

Our sales engineering staff will welcome the opportunity to discuss your coil requirements, and will gladly submit quotations per your specifications on request.

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SQUARE WAVE GENERATOR—Model SG5

An inexpensive step frequency type square wave generator for accurate high speed testing of response characteristics of wide band amplifiers, wide band oscilloscopes, television video amplifiers, etc.

– FEATURES –

1. Five fixed output frequencies of 50, 1000, 100,000 and 500,000 P.P.S.
2. Individual calibration control for each frequency.
3. Rise time .05 microseconds.
4. Output voltage 0.8 to 8 volts peak to peak.
5. Small, compact, portable – completely AC operated.

SIZE 9" x 11" x 11½" WEIGHT 20 lbs.

INSULATION RESISTANCE TESTER—Model MO5

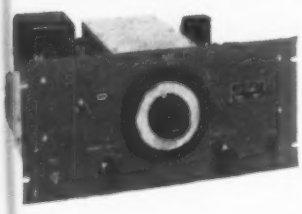
A small compact portable battery operated insulation resistance tester employing a high quality vibrator power supply as a source of high potential. Operates completely from two small self contained 1½ volt batteries. Total current drain only 150 milliamperes.

– FEATURES –

1. Resistance Range – 5000 megohms at 2000 volts D.C. potential.
2. Meter – 4½" rectangular type with 3⅞" scale length.
3. Small and light in weight.
4. Provided with leather strap for carrying.
5. Operates completely from two self contained 1½ volt dry batteries.

SIZE 5" x 5⅛" x 6" WEIGHT 2 lbs.

AUDIO OSCILLATOR—Model TE200K



Frequency Coverage – 20 cycles to 200,000 cycles in four ranges.
Frequency Dial – 6" diameter, direct reading, with planetary drive.
Output Voltage – 10 Volts maximum.
Calibration Accuracy ± 2% of dial setting indication.
Distortion – 3% or less across standard load at any frequency setting and at any output voltage up to maximum.
Hum Level – Minus 50 DB or better.
Standard Load – 1000 ohms resistive.
Frequency Response ± 1 DB from 20 to 200,000 C.P.S.
Drift ± 2% or better.

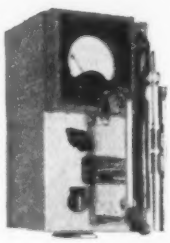
SPECIAL FEATURES

1. Electronically regulated power supply for stable operation under varying line voltage conditions.
2. No electrolytic capacitors are used.
3. Designed for stable continuous operation under the most adverse conditions.
4. Mounts in standard relay rack or table cabinet.

RADIATION SURVEY METER—Model PR-3

FUNCTIONAL DESCRIPTION

Portable Beta-Gamma discriminating count-rate meter with thin glass wall G.M. tube in probe.



CHARACTERISTICS

1. Radiation Detected – Beta or Gamma.
2. Discrimination – Rotating Shield on probe. (2mm Brass)
3. Full Scale reading –
   2 MR/HR 2 MR/HR 20 MR/HR
4. Meter – Navy Type sliding scale with individually colored ranges.
5. Sensitive element – GM Tube – 30 mg sq/cm wall.
6. Power Source – 2 1½V Eveready #742.
7. Minimum Energy Beta detected – 200 KEV.
8. Waterproof Aluminum case.
9. Fungus proofed.
10. Shoulder straps provided.
11. Provision for plug-in phones.

WEIGHT 9½ LBS. SIZE 5⅛" x 7½" x 9½"

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3. Radio Receivers, 35 KC to 400 MC
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5. Regulated Power Supplies (Electronic)
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   (b) High voltage, low current
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9. Oscillators
   (a) Audio, Wien-Bridge (b) R.F., beat frequency, etc. (c) R.F., special applications (d) Magnetostriction (e) Diathermy and RF heating
10. Frequency Standards
    (a) RF secondary standards (b) Audio standards
11. Oscilloscopes for special application
12. Electronic Bridges: capacity, resistance, etc. for special application. Limit bridges
13. Ionization Gauges, electronic
14. D.C. amplifiers
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18. Radio tuners – high fidelity broadcast, AM and FM
19. Television signal boosters
20. Pulse generators and square wave generators

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Gray TELOP (TELevision Optical Projector)

Makes PROFITS GROW for TV Stations. The Gray Telop projects low cost, easily produced TV 'commercials'. Without keystoning, any two photos, titles, slides, etc. or small objects may be broadcast with superimposition, lap dissolve or fade-out. 4 optical openings. Strip material may be used horizontally or vertically with Stages #2 and #3. *(For full details write for Bulletin T-101.)* Price, $3500.00

Gray STAGE #2

Attaches to three optical openings of the Telop. Accommodates roll stock *vertically* to televise commentary or the commercial in the same way movie introductions are projected. Price, $417.94

Gray STAGE #3

Attaches to any optical opening of the Telop. News ticker tape fed from 8-mm reels is projected on any part of the screen, top to bottom, horizontally. May be used with test pattern or other commercial. Price, $314.26

Gray TV CAMERA TURRETS

Enable a Single Camera to Serve up to 8 Projectors

MODEL 556

Centered on a rugged 'square' pedestal, requires a minimum of space. Heavy duty ball bearings. Rotates 360°. Price, $425.00*

MODEL 430

Cantilevered 'overhang' design. Gives more working space where that space is available. Rugged construction, turns on precision ball bearings. Price, $875.00*

*Camera cradle not supplied.

Gray LIGHT BOX for Transparencies

Provides back lighting for Telop use. Price, $178.23

Gray REVERSE READING CLOCK

For use where reversal is required. Designed to permit superimposing of the commercial or other copy. Price, $50.85

Gray MULTIPLEXER Model 600

A precision arrangement of mirrors for operation of pairs of projectors simultaneously into a single TV camera or individually into two separate cameras. *Enables a greater number of projectors to be used with fewer highly expensive TV cameras.* Price, $393.00

Gray SOUND EFFECTS CONSOLE

Finest equipment made for reproducing sound effects in radio and television broadcasting. *For full description write for booklet.* Price, $9750.00

Gray TRANSCRIPTION ARMS

NEW Viscous-Damped Model 108-B Arm

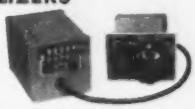
For all records — 33⅓, 45 and 78 r.p.m. Radically new suspension development on the viscous damping principle for *perfect tracking* of records and elimination of tone arm resonances. Instant cartridge change with automatic correct stylus pressure. Solves all transcription problems. IDEAL FOR LP RECORDS. For Pickering, new GE (short), old GE (long) cartridges. Price, less cartridges, $50.70

Model 106-SP Arm

Designed to meet strictest requirements of modern highly compliant pick-up cartridges. 3 cartridge slides furnished enable GE 1-mil, 2½-mil or 3-mil cartridges or Pickering cartridge to be slipped into position in a jiffy. No tools or solder! Superb reproduction of 33⅓, 45 or 78 r.p.m. records. Low vertical inertia, precisely adjustable stylus pressure. Price, less cartridges, $45.15

Gray EQUALIZERS

MODEL 603



Latest of the universally adopted Gray Equalizers used as standard professional equipment by broadcast stations. High-frequency characteristics obtainable comprise 5 steps — flat, high roll-off, NAB, good records, poor records. For both GE and Pickering cartridges. Price, $50.70

MODEL 602 —Has 4 control positions. Highly accurate response curves. Price, $49.50

Gray STYLUS FORCE GAUGE Model 901

Preserve your record library! Check stylus pressure with this new gauge. Accurate to ½-gram. *As simple as it is important to use!* Price, $14.75

All prices f.o.b. Hartford, subject to change without notice.

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For Remote indication and recording

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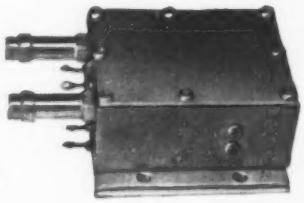
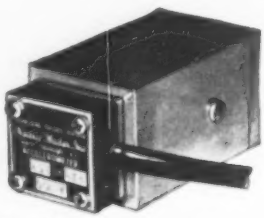
- **The Most RELIABLE precision instruments employing strain gage elements ever constructed**

- Pressure Transmitters
- Accelerometers
- Altimeters
- Air Speed Transmitters
- Custom Instrumentation





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No unbonded strain gage elements to fail under fatigue or give *spurious* signals under shock or vibration.

All bonded strain gage elements fully protected from direct contact with pressurized media and from atmosphere.

Imperceptible zero shift with time or temperature change. *All* instruments compensated for sensitivity change with temperature.

Sensitivity normally in excess of Army-Navy specifications.

Suitable natural frequency available for *every* application.

Lower cost instrumentation with *greater* accuracy, reliability, and ruggedness.

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Quality RADIATION INSTRUMENTS AND COMPONENTS

. . . COUNTER TUBES FOR EVERY PURPOSE

Tube Type	Description	Operating Voltage	Threshold Voltage	Plateau Length	Plateau Slope per 100v	Active Length	Wall MG/CM²	Life	Type Base
1B85	Beta-Gamma Aluminum Wall	900	800	200	3%	2.75"	30	10^{9}	Coaxial
1B86	Miniature Gamma Glass Wall	300	200	60	10%	2.5"	200	5×10^{9}	Loads
1B87	Sub-Miniature Gamma Glass Wall	900	850	100	10% /50v	0.5"	200	10^{9}	Loads
1B88	Sub-Miniature Gamma Glass Wall	300	275	50	30% /50v	0.5"	200	5×10^{9}	Loads
1B102	Beta-Gamma Mica Window	900	825	150	10%	1.7"	2	Unlimited by use	4 pin
1B106	Beta-Gamma Mica Window	900	825	150	10%	1.7"	2	Unlimited by use	Coaxial
1B67	Beta-Gamma Mica Window	1200	1100	200	5%	2.5"	2.0 to 2.5	10^{9}	Loads
1B124	Gamma Ray Chrome Brass	900	800	200	3%	12.5"	300	10^{9}	Coaxial
1B125	Cosmic Ray Chrome Brass	900	800	200	3%	16"	300	10^{9}	Coaxial
1B126	Needle Probe Chrome Brass	900	850	75	5%	10 mm	200	10^{9}	Coaxial

. . . SUBMINIATURE ELECTRON TUBES

Tube Type	Typical Service	Volts E_{c1}	Volts E_{c2}	Volts E_b	μ_A / 1 b	I_A	μmhos Gm	Grid current Signal grid
*5899	Electrometer Tetrode	+3.4	−3	+4.5	12	1	15	3×10^{-15}
*5963	Electrometer & D. C. Amp.	−1.7		+7.5	100	2.0	150	10^{-14}
*5628	D. C. Amp.	−1.0		45	250	17.5	450	10^{-9}

Tube Type	Typical Service	Peak Inverse Voltage	Peak Plate Current	D. C. Output Current	Tube Voltage drop
*5790	Half Wave Rectifier	3000v.	600 μ_A	200 μ_A	5.0v. (max.)

		Striking Voltage	Regulating Voltage	Regulating Range	Max. Regulator Current
5841	Corona Regulator	930	900	2.0—50.0 ma.	50 ma.
5950	Corona Regulator	730	700	2.0—50.0 ma.	50 ma.
VXR-130	Regulator	160	130	1.0—2.5 ma.	2.5 ma.

* All filaments 1.25 volts at 10 ma.

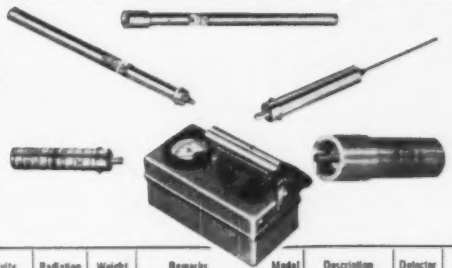
THYAC MODEL 389

An all new portable (5½ lb.) beta gamma survey meter featuring a regulated +vibrator power supply and versatility of application with a selection of coaxial based 900 V counter tubes.

Scale Range

Gamma (Radium)	Beta
0 — 0.2 mr/hr	12 c/sec
0 — 2.0 mr/hr	120 c/sec
0 — 20.0 mr/hr	1200 c/sec

+available as a separate unit



HI-MEG RESISTORS

For electrometer circuits where stability, accuracy, and high humidity operation are of prime consideration.

Characteristics

Resistance Range 10^{6} to 10^{14} ohms

+Tolerance from specified resistance ±1%

Temp. Coeff. .06 to 1.5% C°

Volt. Coeff. −.02 to −.83% V

+Closer tolerance to order

Model	Description	Detector	Sensitivity	Radiation	Weight	Remarks
247A	Portable survey rate meter	ion chamber	4 ranges: 0-2.5, 25, 250, 2500 mr/hr	50 KV X-Ray Gamma	12 lbs.	Ruggedized alum. die cast—Hermetically sealed chamber
247B	Portable survey rate meter	ion chamber	4 ranges: 0-5, 50, 500, 5000 mr/hr	50 KV X-Ray Gamma	12 lbs.	High intensity — Otherwise same as 247A
247C	Portable survey rate meter	ion chamber	4 ranges: 0-2.5, 25, 250, 2500 mr/hr	30 KV X-Ray Gamma	10 lbs.	Same as A exception chamber is directly exposed by hinged case opening
247D	Portable survey rate meter	ion chamber	4 ranges: 0-5, 50, 500, 5000 mr/hr	30 KV X-Ray Gamma	12 lbs.	Same as B exception chamber is directly exposed by hinged case opening
287	"Minometer" Charger reader electrometer and chambers	ion chamber	chamber ranges 0 — .2 r 0 — .01 r 0 — .001 r	X-Ray Gamma	6 lbs.	Personnel protection Measurement minute scattered radiation
382	"Minometer" Portable charger reader electrometer & chamber	ion chamber	chamber range 0 — 100 r	X Ray Gamma	4 lbs.	Battery operated — High intensity
390	"Proteximeter" Area monitor integrating, portable	ion chamber	chamber range 0 — .2 r	X-Ray Gamma	5 lbs.	Desk top model — Direct reading
398	"Proteximeter" Area monitor integrating, portable	ion chamber	chamber range 0 — 50 r	X-Ray Gamma	5 lbs.	High intensity

Model	Description	Detector	Sensitivity	Radiation	Weight	Remarks
389	"Thyac" Portable survey rate meter	geiger tube	3 ranges: 0 — .2, 2, 20	Beta Gamma	5½ lbs.	Regulated vibrator power supply
263B	Portable survey rate meter	geiger tube	3 ranges: 0 — .2, 2, 20	Beta Gamma	11 lbs.	Earphone indicator
356	Portable survey rate meter	ion chamber	2 range 8000, 50,000 disintegrations /min.	Alpha Beta Gamma	8 lbs.	"Zeuto"
70	"Condenser R Meter" Precision electrometer & chamber	ion chamber	various chambers .25 to 5000 r	X-Ray Gamma	12 lbs.	3% accuracy
381	"Integrow" Pre-determined integrating dosimeter	ion chamber	various chambers 0 — 500 r	X-Ray Gamma	72 lbs.	Pedestal mounted chamber probe and remote control unit
382	"Isometer" X-Ray constancy indicator	ion chamber	3 range arbitrary units	X-Ray Gamma	20 lbs.	Continuously indicates % error in beam intensity
510	Roentgen rate meter	ion chamber	4 ranges: 3, 10, 30, 100 r/min	Gamma X-Ray	20 lbs	Wave length 50 KV and up
510A	Roentgen rate meter	ion chamber	4 ranges: 30, 100, 300, 1000 r/min	Gamma X-Ray	20 lbs.	Wave length 50 KV and up

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The Victoreen Instrument Co. 5806 HOUGH AVENUE CLEVELAND 3, OHIO

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- ignition coils
- wire coverings
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- switch base terminals
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- transformers
- condensers

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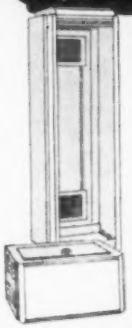

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Developed for simplicity and ease of operation, the HEILAND Automatic Oscillograph Recorder saves time . . . reduces costs. Flexibility of operation permits the recording of strain, vibration, pressure, acceleration and temperatures.

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SPECIAL FEATURES

- Easy loading
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- Lamp burn-out indicators
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- Weight: 59 lbs.

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They are ready and willing to serve you.

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MATCHES COLORS 5 TIMES BETTER THAN HUMAN EYE

Used where colors must be exact — not "close"

Developed by Instrument Development Laboratories in conjunction with Pittsburgh Plate Glass Co., the PPG-IDL is now available to help you take the guesswork out of color matching.

You'll find COLOR-EYE the world's most sensitive production matching instrument because it is not subject to the discrepancies of human vision. A simple electronic and optical system quickly and precisely measures the ratio of brightness between sample and standard. Readings are shown on a direct reading dial to eliminate guesswork and error.

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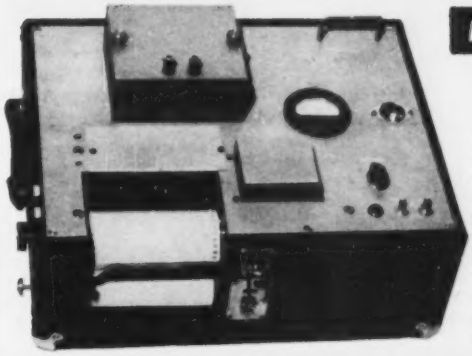


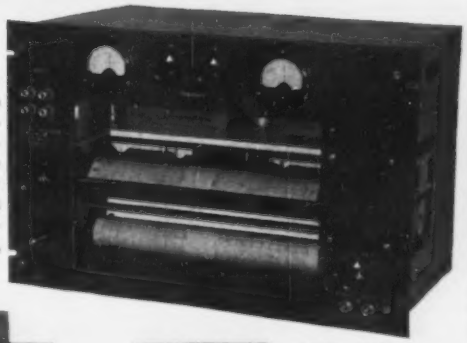
MODEL FR

PORTABLE INK RECORDER

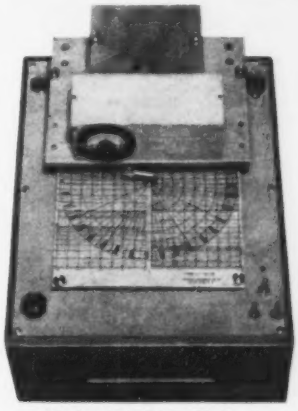
4" recording width—for field and laboratory use. Recently re-designed, incorporating several new important features. A sturdy practical instrument indispensable for rapidly taking frequency response characteristics of any audio apparatus or complete installation.

TWIN CHANNEL RECORDER

MODEL TFR



for convenient and efficient **recording of two** quantities simultaneously. Absolutely self-contained, rugged. Two independent recording channels; two 4" chart widths. Easily connected to oscillators, analyzers, etc.



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MOST RECENT addition to our **RECORDER FAMILY**

POLINEAR RECORDER

combining in one compact unit a POLAR and FREQUENCY RESPONSE RECORDER

Applications:

BEAM PATTERN PLOTTING of antennas, microphones, loudspeakers, lighting fixtures, ultrasonic devices.

FREQUENCY RESPONSE RECORDS of microphones, loudspeakers, amplifiers, filters, radio and television circuits.

RECTILINEAR CURVES on vacuum tubes, potentiometers, amplifiers, counting and computing devices.

Mechanical Link Units for connection of these recorders to signal, sources are available or can be designed for specific requirements.

Technical literature on these and other recorders will be mailed upon request. Consult our engineering staff for special applications.

Designers and Manufacturers of Graphic Recorders

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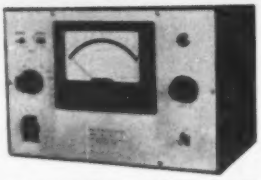
Instruments Engineered for Individual Requirements

PEAK PULSE VOLTMETER—Model 80A

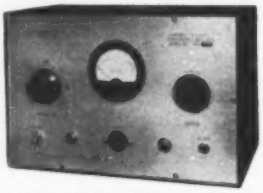
An automatic slideback instrument in which rapid and accurate meter readings are secured at pulse widths of .25 microseconds and at repetition rates of 10 pps. High frequency compensated attenuator precedes the servo amplifier tube to provide suitable ranges and sensitivity. Phase inverter enables instrument to read on either positive or negative pulses. Controls include an on-off switch, range selector switch, input polarity switch, zero-set control, and a switch which throws a D.C. restorer into the circuit, thus permitting peak to peak measurements.



VOLT RANGES: 0-10, 0-50, 0-100, 0-500, 0-1000, 0-5000 volts.
PULSE WIDTH: 0.25 microseconds to 50 milliseconds.
REPETITION RATES: 10 to 20,000 pps.
ACCURACY: ± 3% of full scale.
INPUT IMPEDANCE: 200,000 ohms.

POWER SUPPLY REGULATOR—Model 60

Provides regulated variable frequency A.C. supply when used in conjunction with an audio power amplifier. Power output is that of audio frequency amplifier used. Consists of a variable RC audio oscillator, the output of which passes through 2 AVC controlled stages to input of amplifier. Amplifier output is fed back to regulator and compared with internal voltage standard. AVC voltage derived from this comparison keeps amplifier output constant. Meter reads AC output voltage directly. Regulation depends somewhat on amplifier used. For example: with Bogan HO 125 Booster amplifier (125 watt), regulation is better than 2% from zero to full load.



FREQ. RANGE: 300 to 900 cycles. Other ranges on special order.
OVERALL REGULATION: Normally 3% from 0 to full load.
AVAILABLE DRIVING VOLT: 10v across 600 ohms or 50v across 60,000 ohms.
OUTPUT AVAILABLE FROM P. A.: 60 to 130 V.A.C. The power obtained depends on the capacity of the power amplifier used.

TELETYPE DISTORTION METER—Model 22

A portable unit that measures bias distortions. May be connected in any teletype circuit with the teletypewriter printer without disturbing its operation. Direct reading of amount of bias distortion on the line can be secured. Any change in distortion on the line is indicated and the new distortion readily determined. Operates by generating a pulse of known width which is compared to width of teletype pulses. When width of known pulse is set the same as teletype pulses, a neon lamp blinks and indicates amount of bias distortion.

RANGE: Mark or space bias distortion 0 to 50%.
ACCURACY: ± 3%.
INPUT: 30 or 60 M.A. neutral or polar, 60 WPM teletype signal.
INPUT IMPEDANCE: 200 ohms.

ELECTROTAC* R.P.M. METER—Model 90

An electronic tachometer which indicates directly on a 4" meter the R.P.M. of any spark ignition engine. Does not need to be connected to a rotating member of the engine; a simple connection to any spark plug is all that is required. Connection has no effect on the performance of the engine. A valuable instrument in the design, maintenance and production checking of outboard motors, motor cycle engines, etc. Available with battery supply for portable field use.

RANGES: 0-500, 0-5000 R.P.M.
INPUT: 105v to 125v 60 cycles.
ACCURACY: ± 1% when calibrated against controlled 60 cycle line. Internal calibration switch and adjustment are provided.

*Trade Mark

ELECTRONIC FLUX METER

Newly designed Model 150 —just in production. Write for price and information.

TELETYPE REGENERATIVE REPEATER

The Model 21 Repeater is an electronic unit designed to correct mark-space distortion in teletype signals. Signals of up to 45% distortion applied to the input of the unit are corrected at the output to less than 5% distortion.

C.G.S. LABORATORIES, INC.
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FOR THE ELECTRONIC INDUSTRIES

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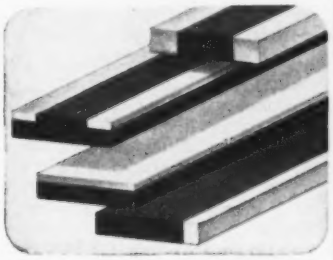
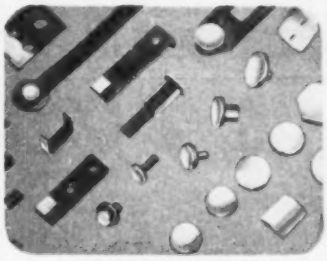
General Plate Laminated Metals are available in strips, sheets, bars, tubing or wire in various sizes and thicknesses. Made by permanently bonding precious metals, such as silver, gold, platinum to base metals, these laminated metals give solid precious metal performance at a fraction of the cost of solid precious metal. The precious metal provides specific performance requirements such as electrical conductivity and corrosion resistance while the base metal reduces costs, provides workability, strength and solderability. General Plate engineers will gladly help you with your problems.



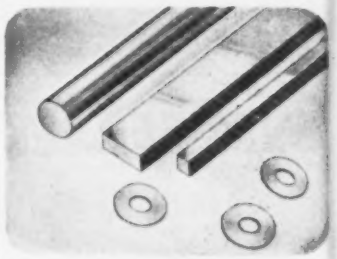
LAMINATED CONTACT MATERIAL

Permanently bonded silver to base metal is available in the following stock—overlay, single and double edgelay, single and double inlay, toplay, ready for you to fabricate into contacts.



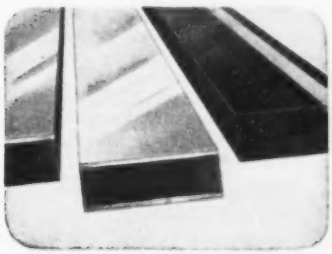
LAMINATED CONTACTS

General Plate can supply all types of fabricated-laminated contacts, buttons, rivets, screws made to customer's specifications. These contacts give high electrical conductivity at reduced costs.



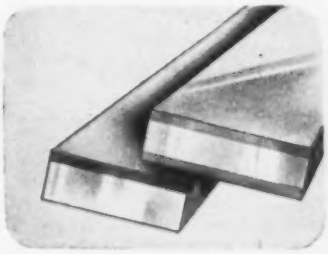
SILVER SOLDER

General Plate manufactures all grades of silver solder, solder filled, flushed, burred, etc., with various flow points for all types of electronic applications.



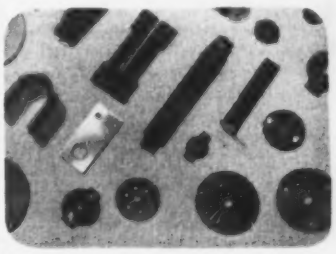
SILVER ON BERYLLIUM COPPER

Laminated silver on beryllium copper is available with the copper covered with silver on one side or both and silver inlay.



ALCUPLATE COPPER ON ALUMINUM

This laminated metal makes aluminum solderable. The copper provides excellent conductivity, the aluminum light weight. Alsiplate (silver on aluminum) is available.



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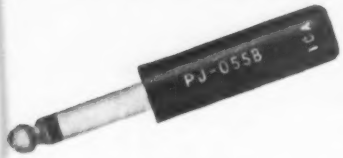

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INSULINE Plug PJ-055B is the new precision-made plug manufactured to meet these precise requirements. It's designed for long life and efficient service under any climatic and operating conditions.

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for REMOTE CONTROL of MULTIPLE COMPLEX CIRCUITS

Many versatile designs of stepping, counting, adding and subtracting, latching, and *circuit selecting* relays are made possible by the combination of the Ledex Rotary Solenoid and wafer type rotary switches. Self-stepped or externally impulsed, the device is immediately adaptable to many remote control applications. A choice of wire sizes permits a wide range of operating voltages and power requirements. Various types of mountings further increase its adaptability. In addition to its positive control of multiple, complex circuits, a reserve of mechanical power is available for the performance of duties other than switching operations.

We supply to quantity users and solicit the opportunity to be of assistance in solving multiple circuit relay problems.

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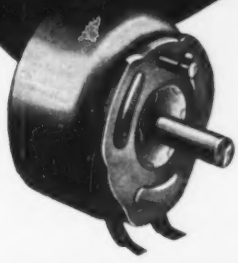

SOLVES MANY REMOTE CONTROL PROBLEMS

The many production applications of Ledex Rotary Solenoids vary from the dependable, snap-action tripping of airborne bomb releases to the actuation of rugged, hydraulic valves in heavy duty materials handling equipment.

Five Ledex Rotary Solenoid models are manufactured. Diameters range from 1⅛ to 3⅜ inches. Predetermined rotation up to 95° can be engineered to suit your product's requirements. Starting torques for 45° stroke range from ¼ pound-inches to 50 pound-inches.

We supply to quantity users and solicit the opportunity to be of assistance in engineering a Ledex Rotary Solenoid to meet your product's requirements.

MODEL NO.	2	5	6	7	8
Diameter	1⅛"	1⅞"	2¼"	2⅞"	3⅜"
Torque lb / inches	¼	5	10	25	50
Weight lbs.	⅛	⅓	1	2¼	4¼

Magnetic action moves the armature along the solenoid axis. This action is converted into a rotary motion by means of ball bearings on inclined races.

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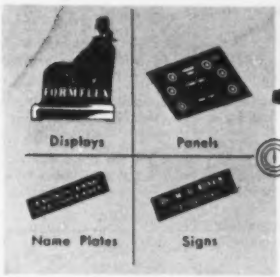
Here is the most versatile machine . . . So simple to operate by unskilled labor.

new hermes Engravograph

This heavy duty bench type model covers a larger engraving area than any other machine of its kind.



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Telephone: Rahway 7-8800 — Cable Address: NATVAR, Rahway, N. J.

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MANUFACTURERS OF Natvar FLEXIBLE INSULATION

NATVAR FLEXIBLE ELECTRICAL INSULATING MATERIALS

STANDARDS Natvar insulations have excellent electrical and physical properties, and meet the requirements of ASTM, NEMA, and other applicable standards with ease. These industry standards for such properties as dielectric strength, tensile strength, heat and oil resistance, as determined by specified test procedure, protect the buyer against inferior materials. At the same time, they provide the buyer with a valid basis for comparison which should enable him to buy quality materials best suited to his needs. Full test reports on Natvar insulations are available on request.

PERFORMANCE Performance is the prime consideration in the manufacture of Natvar insulations. New materials and new methods are constantly being studied and developed to provide improved performance under service conditions. As an example, Natvar 400 extruded vinyl tubing, accepted for its high heat resistance (approved for 105°C) is also outstanding in its resistance to oil, and shows no tendency toward embrittlement when immersed in hot oil for prolonged periods. From the standpoint of performance this is important, because it means that leads insulated and protected with Natvar 400 stay flexible after varnish baking.

UNIFORMITY Natvar insulations give extra protection because of their exceptional uniformity. This uniformity also means that Natvar insulations can be depended upon to be the same, no matter when or where the order is placed.

CONTROL Raw materials, fabrics and papers are laboratory checked against our specifications. Materials in process are subject to constant laboratory control. Both plant and equipment are modern. Natvar insulations are made by experienced production men.

SERVICE Shipments of Natvar standard insulations are usually made on the same day the order is received either from distributors' stock or direct. Orders for special insulations are handled promptly. For problems where special insulations are required to meet unusual conditions, engineering service is available, without obligation. To expedite shipment, give complete detail with each order.

VARNISHED CAMBRIC

Straight cut for application in regular smooth surfaces, bias for irregular surfaces. Supplied in all normal commercial sizes and thicknesses, in yellow or black, and in four finishes, greasy, tacky, dusty and dry. Physical and electrical properties comply with ASTM Specifications with ample safety factor.

VARNISHED CAMBRIC TAPE

Supplied straight cut or seamless bias, in all normal widths and thicknesses, yellow or black, greasy, tacky, dusty or dry. Characteristics same as for VC. Accurately slit for use in taping heads.

VARNISHED CANVAS AND DUCK

For use where greater mechanical protection is required. High strength fabrics coated with same high grade varnishes as VC.

VARNISHED SILK

For use where requirements call for very thin, high dielectric insulation.

VARNISHED SPECIAL RAYON

For use where high tensile and high dielectric strength are required in addition to smoothness and minimum clearance.

VARNISHED FIBERGLAS

Natvar Varnished Fiberglas is Class B insulation for equipment which operates at temperatures above normal safe working range of varnished cambric. Has great mechanical strength and excellent dielectric properties. Available in rolls, tape and full width sheets to 36".

SILICONE COATED FIBERGLAS

For higher permissible temperatures. Available in tape, sheets and rolls 36" wide.

SLOT INSULATION

Combination of Copaco 100% rag paper stock to which a layer of Natvar VC is firmly bonded. The high dielectric strength and moisture resistance of Natvar VC together with the toughness and abrasion resistance of 100% rag paper make a slot insulator which will withstand pounding and chafing without impairment of its electric properties. Rolls or sheets approximately 36" wide.

VARNISHED PAPERS

Chemically inert rope and kraft stocks selected for uniform thickness, tensile and dielectric strength and for freedom from pinholes. In yellow varnished, condenser type tissues and yellow or black varnished heavy papers.

SATURATED SLEEVING

Smooth rayon or Fiberglas braid, single, double or triple saturated with varnish or synthetic. Flexible and smooth for fast application to soft or stranded leads. Wide range of vivid colors for coding. All sizes.

VARNISHED AND LACQUERED TUBING

Smooth rayon or Fiberglas braid impregnated and coated with varnish, or coated with lacquer, in a continuous coating. Exceptionally smooth and flexible. Meets ASTM and NEMA Specifications with ample margin. Several grades to meet various dielectric, aging and heat endurance requirements. Also in heavy-wall cotton braid where higher mechanical strength is required and O.D. is not a limiting factor. Vivid colors for coding. All sizes.

EXTRUDED VINYL TUBING

Natvar 400, for applications requiring high resistance to both heat and oil, is approved by Underwriters' Laboratories for continuous operating temperatures of 105°C, and stays flexible when immersed in hot oil for prolonged periods. It is a well balanced tubing that is tough, elastic, flexible, resistant to abrasion and tear, inert and resistant to oils, waxes, alkalies, acids and most solvents. Available in black, white, transparent and several colors.

V.I.T. 200 is an all-purpose tubing with excellent flexibility through a temperature range of —40°C. to + 85°C. Melts at high temperatures but will not support combustion. Shows no disintegration or flaking when immersed in oil. In general has the same inherent characteristics as Natvar 400, but slightly higher tensile strength, averaging 3600 p.s.i.

IDENTIFICATION MARKERS

Short sleeves of varnished braid or extruded vinyl, marked with numbers or letters or both for identifying terminals of complex wiring systems, such as airplane ignition systems. Wide color range, any size, any marking.

SPECIAL PRODUCTS

Our laboratory, manufacturing facilities and engineers are at your service to help with problems not solved by standard materials.

KOTRON SELENIUM RECTIFIERS

GUARANTEED BLOCKING 40 VOLTS PER CELL!

1/3 LESS SPACE – 1/3 LOWER COST

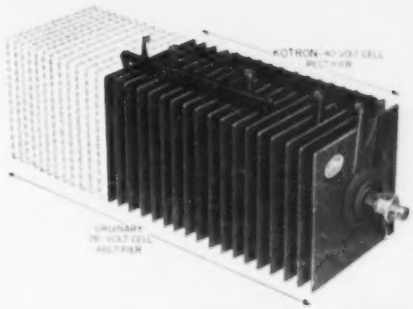
KOTRON alone manufactures selenium rectifiers to block from 6 to 40 volts A.C. rms per cell with optimum current rating for each voltage. Kotron is the first to produce commercial rectifiers embodying this relationship. In high voltage applications, Kotron uses fewer cells than ordinary rectifiers—thus reducing size and cost. In low voltage applications, Kotron works at higher current densities per sq. in. of rectifying area than ordinary selenium rectifiers, reducing size and lowering cost.

In either direction, Kotron sets new standards!

Kotron mechanical features match Kotron superior electrical characteristics. Square or rectangular plates offer maximum wattage in minimum space. Rectifier cells and terminals are mechanically interlocked to prevent twisting out of alignment in stack assembly (pat. pending). Double terminals, where necessary, facilitate connection to external circuits. Echelon terminal structure eliminates soldered or internal stack connections.

KOTRON rectifiers whether for 1 ampere or thousands of amperes, are custom-built and tailored to the application, giving maximum efficiency with minimum cost. Kotron rectifiers are manufactured by selenium rectifier specialists with years of technical experience. Their specialized engineering knowledge and consulting service is available without obligation.

Write for descriptive sheets. Submit specifications on your requirements for quotations.



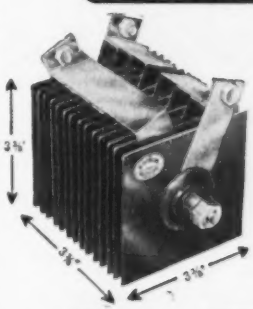
NEW STANDARD FOR HIGH-VOLTAGE, LOW-CURRENT SELENIUM RECTIFIERS

30 Bridge, 125 volt, 4.75 amp., self-cooled KOTRON RECTIFIER

KOTRON Rectifier — 73 CU. IN.

Ordinary Selenium Rectifier — 122 CU. IN.

COMPARATIVE SIZES OF RECTIFIERS FOR SAME WATTS OUTPUT



NEW STANDARD FOR LOW-VOLTAGE, HIGH CURRENT SELENIUM RECTIFIERS

1 Ø, 9-volt, 100 amp. center-tap, fan-cooled, fast-charger KOTRON RECTIFIER (44 cu. in.)

KOTRON Rectifier — 44 CU. IN.

Copper Sulfide Rectifier — 61 CU. IN.

Ordinary Selenium Rectifier — 127 CU. IN.

Copper Oxide Rectifier — 883 CU. IN.

COMPARATIVE SIZES OF RECTIFIERS FOR SAME WATTS OUTPUT

Proportionate savings in size and weight for low-voltage, high-current applications such as electro-plating, power supplies, etc.

NEMA

KOTRON RECTIFIER CORP.

AN AFFILIATE OF STANDARD ARCTURUS CORPORATION

54 CLARK STREET — NEWARK 4, N. J.

GRAYHILL SWITCHES and RELAY

GRAYHILL NO. 2000 SNAP ACTION SWITCHES

Momentary contact, single pole, single throw type. Audible click when switch is activated. Approx. .050" pre-travel, virtually no over-travel. Contact gap .015". Single hole panel mounting. Two hex nuts. Bushings 15/32"—32 thread.

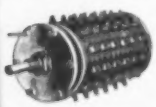
NO. 2201 NORMALLY OPEN
NO. 2202 NORMALLY CLOSED
Rating—10 Amps., 115 volts AC
1 Amp., 115 volts DC

GRAYHILL NO. 4000 PUSH BUTTON SWITCH

Non-snap action. Momentary contact, single pole, single throw type. Over-travel approx. .046", pre-travel .078". Single hole panel mounting. Bushing 15/32"—32 thread) and hex nut assembly.

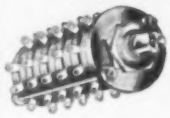
NO. 4001 NORMALLY OPEN
NO. 4002 NORMALLY CLOSED
Rating—1/3 Amp., 115 volts, AC

Grayhill No. 3000 ROTARY TAP SWITCH



For special-circuit-combination applications. 1 to 12 decks. 2 to 11 contacts per deck. Rated at 20 Amps., 115 Volts AC.

GRAYHILL NO. 5000 MINIATURE ROTARY TAP SWITCH

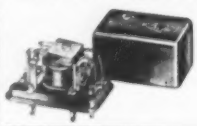


SHORTING (make before break) and NON-SHORTING (break before make). From 1 to 10 decks. Accommodates up to 10 contact positions on each deck. With 10 positions, switch rotates 360° in either direction. When 9 or less positions—stops permit rotation only through required positions. Nickel-plated brass rivet contacts—silver-plated rotor blade. Exterior metal parts are cadmium-plated. Bushing, 3/8"—32 thread. Behind panel length from 27/64" (1 deck) to 4 1/2" (10 decks).

Rated to break—1 Amp., 115 Volts AC to carry—5 Amps., 115 Volts AC

Grayhill PLUG-IN RELAY

No wires. Plug connectors for rapid insertion. Contact arrangements—SPST, SPDT, DPST, DPDT. Range, 6-230 Volts AC or DC.



Silver contacts rated at 10 Amps. per pole on a resistance load.

Grayhill

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Chicago 24, Illinois

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Most material shipped immediately from stock. Let us quote on your requirements. Quotations for built to order instruments cheerfully given.

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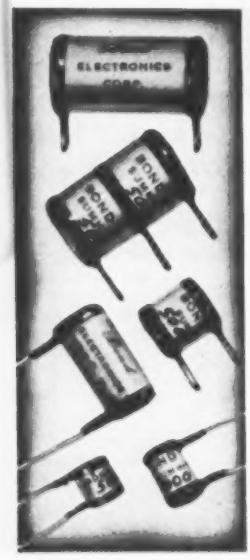

Photograph shows actual sizes

Miniaturize NOW

WITH BOND PRECISION WIRE WOUND RESISTORS AND COILS

BOND maintains a complete line of precision wire-wound resistors engineered for lower cost and higher resistance in smaller type bobbins. By special design, the resistance range of all BOND resistors has been extended without the use of special alloys at a higher cost.

Miniature type 503 (shown at the bottom of the photograph) rated at a maximum resistance of 125,000 ohms and 1/5 watt dissipation is the smallest non-inductive unit now being manufactured.

All standard units are protected at no extra cost from humidity and fungi by a special process incorporating two layers of varnish impregnation. After labeling, all resistors are coated with a third layer of a BOND exclusive material protecting the labels and resistors from flame, oil, abrasive material, salt water and extreme thermal shocks.

The entire BOND line of resistors is manufactured in accordance with JAN-R-93 specifications.

BOND coil facilities now available:

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- INDUSTRIAL
- SOLENOID
- BOBBIN
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SPEAKERS

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IN REPLACEMENT FIELD

FIRST
FOR ORIGINAL EQUIPMENT

ONLY QUAM SPEAKERS
have the
U-SHAPED COIL POT
and
ADJUST-A-CONE
SUSPENSION

U-SHAPED COIL POT is used throughout the QUAM Line and provides an unbroken flux path of sufficient cross section to carry the full energy of the magnetic field. U. S. Pat. No. 2,020,211 and 2,020,212.

ADJUST-A-CONE SUSPENSION—While in other speakers the spider is cemented in place with no provision for final adjustment, the QUAM method permits precision centering of the voice coil in the final production operation. U. S. Pat. No. 2,475,516.

UNIVERSAL BRACKET, provided with all QUAM 3½" to 6½" speakers, makes the most difficult installations easy.

ELECTRO-DYNAMIC AND PERMANENT MAGNET SPEAKERS in the following sizes 3½", 4", 5", 5¼", 6½", 7", 8", 10", 12", 4" x 6", 5" x 7", 6" x 9".

PUBLIC ADDRESS P.M. SPEAKERS in 8", 10" and 12" sizes.

CO-AXIAL SPEAKERS—12" with a 3" tweeter, 15" with a 5" tweeter.

TELEVISION SPEAKERS, Electro-Dynamic and P.M., in all sizes.

QUAM FOCALIZER UNIT utilizes Alnico V Permanent Magnets instead of the more expensive and less stable wire-wound construction. Provides a sharper focus of television image and is unaffected by operating temperatures and voltage fluctuations. Write for details on this unit and Quam Ion Traps.

WRITE FOR COMPLETE DESCRIPTIVE CATALOG!

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Makers of Quality Speakers for 27 Years.

PLAY SAFE WITH A LEADER-

in the Radio, Electronic and Television Industries

Glaser LECTRON ROSIN CORE SOLDER

Acclaimed by manufacturers across the country, in the radio, electronic, and television industries as the "best"* activated rosin core solder for speeding soldering operations on the production line.

Made with an exclusive activated rosin flux, **Glaser Lectron Rosin Core Solder** is more efficient and faster than plain rosin core solder. Bonds copper, brass, nickel, chrome, and other metals *perfectly* and *permanently*—yet is non-corrosive and non-conductive. Available in any tin-lead alloy and wire gauge.

** Satisfied users of Glaser Lectron Rosin Core Solder report gains of 15% or better in soldering speed on their production lines.*

GLASER ROSIN CORE SOLDER

Both Glaser Lectron Rosin Core and Glaser Rosin Core Solders are made from the purest virgin tin and lead, and perfect flux. They take hold instantly—forming a permanent solder bond.

For greater economy in your soldering operations specify Glaser's Core Solders.

OTHER GLASER PRODUCTS

Glaser Solder Pre-forms, Glaser Bar, Solid Wire, or Ingot Solder, Glaser Fluxes for every purpose.

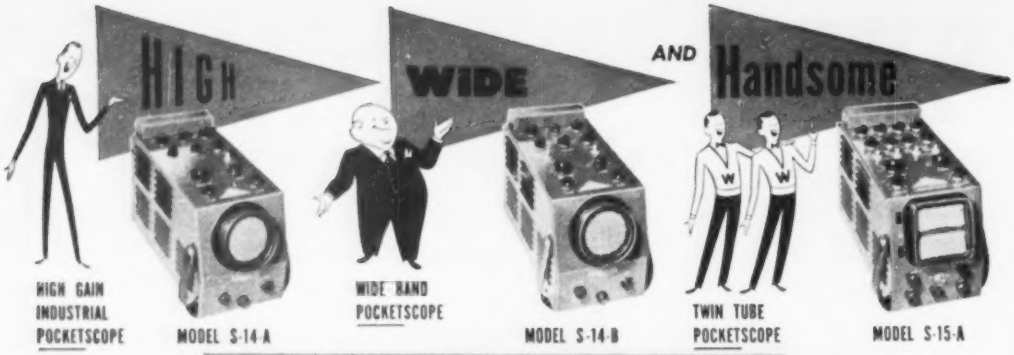
Our Engineering Department will gladly assist you with any soldering or flux problem, without any obligation. Free solder or flux sample upon request.

The Quality Line

GLASER LEAD CO., INC.

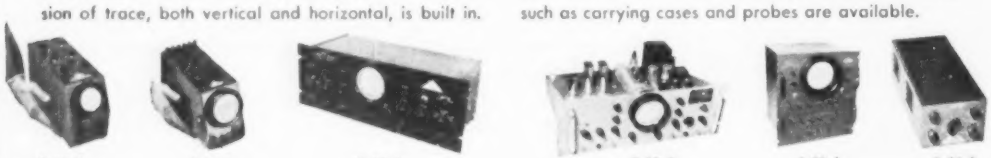
21-31 Wyckoff Avenue, Brooklyn 27, N. Y.

OUR 28TH YEAR OF DEPENDABLE SERVICE TO AMERICAN INDUSTRIES



THE WATERMAN LINE-UP

HI, WIDE and HANDSOME POCKETSCOPES are characterized by small size, light weight, and outstanding electrical performance. All units have frequency compensated attenuators as well as non-frequency discriminating gain controls. All units have both periodic and trigger sweeps from ½ cycle to 50KC. The amplifiers are direct coupled thus frequency response starts from 0 cycles. No peaking coils are used, thus, the transient response is good. Full expansion of trace, both vertical and horizontal, is built in. Combination filter and graph screens are used for better visibility, thus traces can be observed even under high ambient light condition. Binding posts for convenience of connections, with effective shield, are used. S-14-A has sensitivity of 10 mv/inch with pass band above 200KC. S-14-B has sensitivity of 50 mv/inch with pass band above 1 megacycle. S-15-A is similar to S-14-A except that it has two independent CR Tubes for multi-trace oscilloscope work. Accessories such as carrying cases and probes are available.



POCKETSCOPES and RAKSCOPES have achieved a reputation for dependability and accuracy. The LINEAR TIME BASE can be used with the S-11-A POCKETSCOPE or with any other oscilloscope to convert the scope to trigger operation from ½ cycle per second.

WATERMAN RAYONIC TUBE DEVELOPMENTS

Since the introduction of Waterman RAYONIC 3MP1 tube for miniaturized oscilloscopes, Waterman has developed a rectangular tube for multi-trace oscilloscopy. Identified as the Waterman RAYONIC 3SP, it is available in P1, P2, P7 and P11 screen phosphors. The face of the tube is 1½" x 3" and the over-all length is 9¼". Its unique design permits two 3SP tubes to occupy the same space as a single 3" round tube, a feature which is utilized in the S-15-A TWIN-TUBE POCKETSCOPE. On a standard 19" relay rack, it is possible to mount up to ten 3SP tubes with sufficient clearances for rack requirements. Photographic means of recording are under development and will be available shortly.

TYPICAL OPERATION

TUBE	VOLTS ANODE #2	VOLTS ANODE #1	VOLTS GRID #1	V. VOLTS D1, D2	V. VOLTS D3, D4	MAX. VOLT ANODE #2	MAX. VOLT ANODE #1	VOLTS HEATER	CURRENT HEATER
3SP	1000 2000	150 to 310 330 to 620	−28 to −67 −58 to −135	73 to 99 136 to 159	50 to 70 104 to 141	2700	1100	6.3	.6 Amp.
3MP	1000 2000	150 to 350 400 to 700	0 to −65 0 to −126	140 to 190 280 to 360	130 to 180 260 to 360	2500	1000	6.3	.6 Amp.

WATERMAN PRODUCTS

WATERMAN PRODUCTS CO., INC.

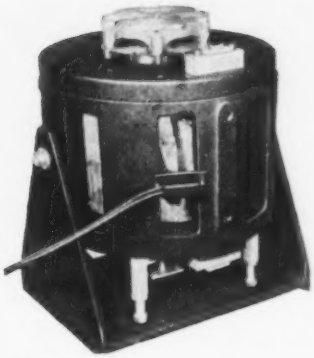
PHILADELPHIA 25, PENNA., U.S.A.

MANUFACTURERS OF: POCKETSCOPES ® — RAKSCOPES ® and RAYONIC ® TUBES

CABLE ADDRESS: POKETSCOPE, PHILA.

THE MB MANUFACTURING COMPANY, INC.

1070 State Street, New Haven 11, Conn. • Products for the Measurement, Reproduction and Control of Vibration



S-3 EXCITER

MB VIBRATION EXCITERS and CALIBRATORS

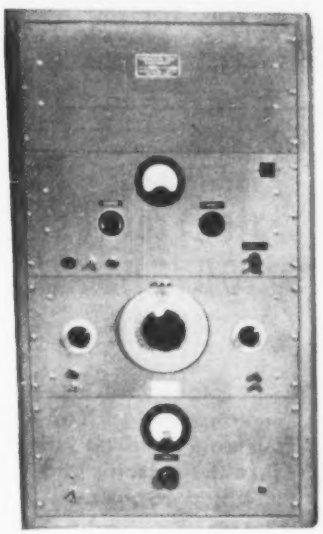
These MB products have shown themselves to be valuable, versatile test and quality-control tools to industry. Producing results quickly, dependably, and often *visually*, they have many important applications. For example: (1) Fatigue testing of mechanical and electrical structures to destruction under dynamic loads . . . (2) Determination of noise sources in automobiles, bodies and chassis, air conditioning equipment, blowers and similar equipment. . . . (3) Shake testing of light electrical components such as relays, switches or radio chassis to determine the ability of components to operate under high vibratory loads. . . . (4) Determination of damping characteristics of rubber, steel, brass, plastics and other materials. . . . (5) Identification of resonant frequencies and modes. These exciters also provide a convenient means for determining natural modes of wings, stabilizers, fin and control surfaces on aircraft structures.

The Model C-1 and C-31 Vibration-Pickup Calibrators listed below have been specifically designed for the requirements of calibration work. Not only can they be used for calibration of vibration pickups over wide frequency range, but also as vibration exciters.

Model No.	Rated Force	Total Stroke	Power Supply	Usable Range c.p.s.
S-A	10 lb.	½ in.	Electronic	20 to 20,000
C-31	25 lb.	½ in.	Electronic	4 to 70,000
C-1	50 lb.	½ in.	Electronic	4 to 70,000
S-3	200 lb.	1 in.	Rotating	3 to 500

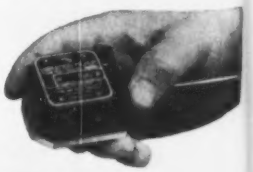
LARGER FORCE RATINGS ARE ALSO AVAILABLE • WRITE FOR DATA.

T112031 POWER SUPPLY (for Model C-1)



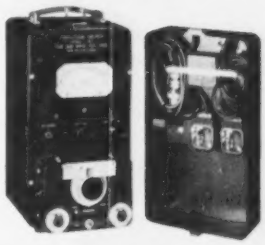
MB VIBRATION PICKUP

An aid to vibration control and production inspection . . . sensitive to low amplitude vibration . . . can be used with wide range of equipment . . . simple field adjustment converts from horizontal to vertical use . . . electrically damped . . . maintains calibration over wide temperature ranges . . . resonant frequency below 5 c.p.s.



MB VIBRATION METER

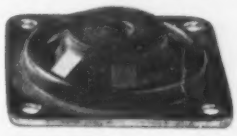
This precision Model "M-1" meter offers a complete, compact unit for vibration measurements when used in conjunction with the MB vibration pickup. It provides for accurate readings of accelerations, velocities, amplitudes. Simple, rugged, battery-operated, and portable, it is outstanding for quality control or research.



ISOMODE* COMPRESSION-TYPE ISOLATORS

These units utilize the properties of rubber in balanced compression and shear. They provide large deflection ratings together with high load capacity, small size, and exceptional stability. Have equal spring rates in all directions—mount at any angle—absorb vibrations for every plane. Unit load-range 50 lbs. to 2500 lbs. Write for the *Isomode* Design Chart.

STANDARD PLATE-TYPE ISOMODE* MOUNTS



These vibration isolators are built with standard mounting dimensions—are available for loadings of ½ to 100 pounds per unit. An outstanding feature is the equal spring rate in every direction. No matter at what angle they are installed, they will absorb vibration with same high efficiency. *Reg. U. S. Pat. Off.

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TOROIDAL INDUCTANCES OF HIGH "Q"UALITY

Toroidal Inductances wound on Molybdenum Permaloy compressed powered dust cores are available in all practical inductance values. Several core sizes and types are stocked making it possible to supply high Q inductances, especially suitable for *your* frequency and load ranges. We supply Inductoroids either cased or uncased

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Because of their high Q, great inductance stability, and extremely low pick-up from external fields toroidal coils are highly desirable for such applications as wave filters, equalizers, and similar circuits. We supply these networks built to meet your circuit specifications or we will design and build such networks to meet your performance specifications.

Important! Send us your specific requirements.

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BOTH Models Conform With Fire Underwriters and National Electrical Code Requirements for OUTDOOR installations.

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SIMPLE TO INSTALL . . . For maximum efficiency, arrester should be mounted outside window nearest to TV receiver, with ground wire attached to nearest grounded point. No stripping, cutting or spreading of wires necessary. Supplied complete with 4 ft. length of Ductile Aluminum Ground Wire for Wall Mounting, and Strap for Mast or Grounded Pipe installation.

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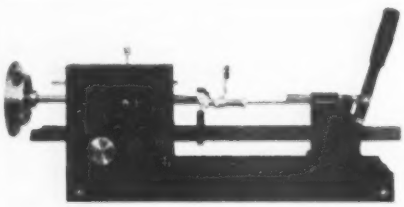

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SPRING-HINGED CONTACT ARM FOR UNIFORM, UNCHANGEABLE CONTACT PRESSURE •
EASY AND SMOOTH TO OPERATE
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D-C BRIDGE CONTROL energized by 0-100V d-c, for resistance bridge work.

A-C BRIDGE CONTROL energized by 0-10V 5 kc-100 kc carrier.

These self-contained units provide power, balancing voltage, calibrating means and sensitive meter, - for use with differential transformers, strain gage bridges, etc. - for measurement of Pressure, Displacement, Force, Vibration, Temperature, Strain, etc. Static or Dynamic Studies.

OSCILLOSCOPE 5-RP tube, 25kV accel. potential, sweeps up to 0.3 u-sec., sweep delay 0.5 u-sec. to 100,000 u-sec. single shot gate.

THICKNESS GAGE 1 micro-inch to 1 inch range, plus-minus deviations from a standard are shown on meter or CRT. For measurement or control.

CALIBRATOR continuously adjustable signal voltage, 8 ranges, indicated on built-in precision meter.

TECHNICAL SERVICE CENTER provides consultation on instrumentation and experimental stress analysis (viz., stresscoat and strain gage applications.) Product design. Complete fact-finding facilities.

INDUSTRIAL ELECTRONICS, INC.

8060 WHEELER STREET DETROIT 10, MICHIGAN

"Custom Builders of Electronic Instruments Since 1943."

a plus feature

Immediately following the Product Listings in the

DIRECTORY SECTION

of this Issue

is a list of more than

2500

TRADE NAMES

of electronic and allied products.

They are intended for your use in determining the manufacturer's name when only a trade name is known.

The answer to many of your UHF insulating, sealing, terminating problems. Write for free literature and samples.

SELF BONDING TAPE

for Insulating and Hermetic Sealing

Radio • Television • UHF Components • Installations

- Excellent HF Dielectric—S.I.C. 2.13 and P.F. 0.004 @ 10 mc. Breakdown over 1000V/MIL.
- FUSES TO A SOLID MASS—positive, permanent moisture seal.
- Unaffected by moisture, corrosive fumes, ozone, sunlight, oxygen, or corona.
- Shapes to any contour.

Ideal for sealing HF pi inductances, HV lead-ins, and HF power supply parts. Provides arcover protection at high altitudes—used for coaxial or flat line splicing and sealing.

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Tel: Longacre 4-8175

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127 SUSSEX AVENUE

NEWARK, N. J.

Inert gas rectifier and thyratron tube specialists since 1928. Send for our catalog.

STOP MOISTURE INFILTRATION

INSULATE WITH INSL-X

INHIBIT FUNGUS ATTACK

A COATING FOR EVERY APPLICATION

A partial list of INSL-X product groupings is given below: literature and samples gladly furnished on request. SPECIAL INSULATION:

FUNGICIDAL COATINGS that prevent moisture infiltration and effectively inhibit organic attack. All of the coatings are easy to apply, non corrosive, biologically effective, and non toxic to humans. INSL-X fungicidal coatings meet rigid Government specifications.

ARC RESISTING COATINGS that in addition to arc resistance, possess very high dielectric strength, water resistance, and the ability to withstand high intermittent temperature up to 400° F. or prolonged temperature up to 300° F.

COIL COATINGS that are rapid drying, have high dielectric strength and are chemically neutral to fine wire. They are thermally stable, and suitable for long lived applications. Outstanding anti-corona properties are highly desirable for *TELEVISION INSULATION*.

TOOL INSULATION. A tough, high dielectric acid resisting, waterproofing compound designed for the insulating of tools. It may be reinforced and built up to practically any dielectric and mechanical strength by the use of glass, asbestos or fabric sleeving or tape. This method provides a foundation capable of withstanding severe impact and abrasion.

INSULATING VARNISHES. A series of air drying and baking materials designed for various applications.

1. **High Speed Armatures**
2. **Rotating Fields**
3. **Transformers**
4. **Industrial Motors**
5. **Magnetos**
6. **Repair Shop Use**

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New York, N. Y.

PENNSYLVANIA
Dan J. Connor Company
1036 Broad Street Station
Philadelphia 7, Penna.

MASSACHUSETTS
Holliday Hathaway Sales Co.
238 Main St.
Cambridge 42, Mass.

OKLAHOMA
C. B. Anderson Co.
712 Okl Capitol Building
Tulsa 3, Oklahoma

ILLINOIS
R. A. Stamm
21 E. Van Buren St.
Chicago 5, Ill.

TEXAS
H. W. Zuch (representative)
402 Nalle Bldg., Austin, Texas
102 Thomas Building
Dallas, Texas

CALIFORNIA
J. C. Van Groos
1436 North Serrano Ave.
Hollywood 27, Calif.

MICHIGAN
H. C. Sweet Co.
12083 Woodbine Ave.
Detroit 28, Michigan

CANADA
O. Biedermann Co.
1514 University Tower
Montreal, Canada

THE INSL-X COMPANY • INC.

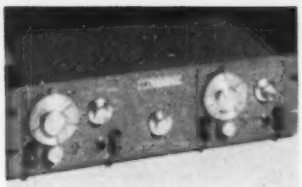
MANUFACTURING ENGINEERS OF INSULATING, FUNGICIDAL AND PROTECTIVE ELECTRICAL COATINGS

WATER STREET • OSSINING • NEW YORK

SKL

ELECTRONIC INSTRUMENTS

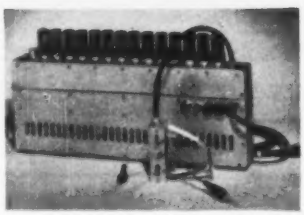
VARIABLE ELECTRONIC FILTERS (302)



1.	CUTOFF RANGE:	20 cycles to 200 KC
2.	FILTER SECTIONS:	two
3.	INSERTION LOSS:	0 db
4.	ATTENUATION RATE:	36 db per octave maximum
5.	FUNCTION:	High-pass, low-pass, band-pass

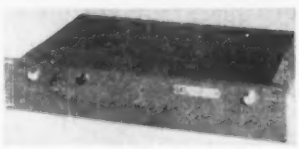
6. Also available, the Model 300 single-section Filter.

CHAIN PULSE AMPLIFIER (214)



1.	BANDWIDTH:	40 KC to 100 MC
2.	PULSE GAIN:	30 db
3.	RISE TIME:	.006 microseconds
4.	OUTPUT VOLTAGE:	65 volts
5.	PULSE GAIN:	30 db
6.	INPUT IMPEDANCE:	180 ohms

WIDE-BAND CHAIN AMPLIFIERS (202P)



1.	BANDWIDTH:	100 KC to 200 MC
2.	VOLTAGE GAIN:	20 db
3.	RISE TIME:	Less than .003 microseconds
4.	IMPEDANCE:	200 ohms

5. Also available, Model 200A, single-stage; Model 204, four-stage; Model 212TV Amplifier.

WRITE FOR COMPLETE INFORMATION

Manufacturers of Wide-Band Amplifiers for Television, Continuously Variable Filters, Temperature Controls, Knobs, and Power Supplies.

SKL SPENCER-KENNEDY LABORATORIES, INC.
186 MASSACHUSETTS AVE.
CAMBRIDGE 39, MASSACHUSETTS

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WORLD'S LARGEST MANUFACTURERS OF AND WORLD HEADQUARTERS FOR

PULSE TYPE MAGNETRONS — Tunable or fixed frequency — 1,000 to 25,000 megacycles — power range from a few watts to several megawatts.

CW MAGNETRONS — Fixed frequency, tunable and frequency modulated tunable — 1,000 to 10,000 megacycles — power range from a few watts to several kilowatts.

KLYSTRONS — Integral and external cavity, low power — frequency range, 500 to 50,000 megacycles.

SPECIAL PURPOSE TUBES* — Cold-cathode, gas-filled rectifier tubes — ruggedized diodes, triodes and pentodes for aircraft, industrial and military service — voltage regulator, voltage reference and radiation counter (Geiger-Mueller) tubes — germanium crystal diodes.

SUBMINIATURES* — Low drain, filamentary tubes; fit standard sockets or may be soldered or welded into the circuit. Over 40 types — over half a million in stock — available through 310 Raytheon Tube Distributors.

For detailed information, get in touch with

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***Power Tube Division** — WALTHAM 54, MASS.

***Receiving Tube Division** — NEWTON 58, MASS.

RAYTHEON

Excellence in Electronics

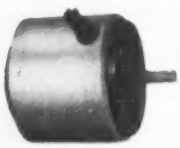
ALTERNATORS · FRACTIONAL H. P. MOTORS · BLOWERS

SPECIAL ENGINEERED E-A-D MOTORS

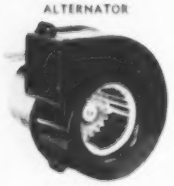
SPECIAL & STANDARD ROTATING ELECTRICAL EQUIPMENT

400 CYCLE MOTOR

AXIAL FLOW BLOWER



ALTERNATOR



CENTRIFUGAL BLOWER

MILITARY MOTORS • BLOWERS • GENERATORS

400 and 60 Cycle—Variable Frequency

Our Military units are designed to meet all important "JAN" specifications and they can be manufactured to meet AAF Humidity specification 41065B Method 31.

FEATURES: Ball bearings throughout with accepted lubricant • Anodized aluminum construction • Wide ambient temperature range • Radically improved cooling means • Minimum size and weight • Improved humidity protection • Fungus proofed.

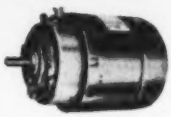
	MOTORS					BLOWERS			
	hp	Model No.	Speed RPM	Dimensions O.D.	Length	CFM	Model No.	Capacitor Motor Type
400 Cycles 115 V. 1 Phase	1/50	J31 (A)	7000	2"	3 1/4"	22	J51 (E)	J31A
	1/100	J31E (A)	7200	2"	3 1/4"	15-20	B3P2Q (F) (E)	J31E
	1/200	J31G (C)	8000	2"	3 1/4"	13	J55 (E)	J49A
	1/200	J33 (C)	8000	1 1/4"	2 1/4"	110	J56B (E)	J72B
	1/50	J33D (A)	7000	1 1/4"	2 1/4"	375	J81 (G)	J33D
	1/400	J48A (A)	7000	1 1/4"	2 1/4"			
	1/15	J72 (A)	5400	3 1/4"	3 1/4"			
	1/50	J72B (A)	4700	3 1/4"	3 1/4"			
60 Cycles 115 V. 1 Phase	1/300	J49D (A)	3000	1 1/4"	2 1/4"	10	J50 (E)	J49D
	1/300	J49E (D)	3000	1 1/4"	2 1/4"	20	J50-1 (E)	J49D
	1/100	J49F (A)	3000	1 1/4"	2 1/4"	20	J50E (E) (D)	J49E
	1/50	J71 (A)	3300	3 1/4"	3 1/4"	6	J54 (E)	J49D
						110	J57 (E)	J71
						125	J57-9 (E)	J71C-4
						170	J80A (G)	J49D
						475	J87 (G)	J71

A—Capacitor C—Synchronous 3 phase D—Cap. Double Shaft Ext. E—Centrifugal F—Variable Frequency Centrifugal G—Propellor Fan.

	Model	Rating	Output
AC Alternator	J15	25 V., 250 Cy. at 5000 rpm	— —
	N2A	115 V., 400 Cy. at 6000 rpm	46 V.A.
	N2B	115 V., 60 Cy. at 3600 rpm	15 V.A.
	N3C	15 V., 180 Cy. at 3600 rpm	1.3 V.A.
	N4A	70 V., 60 Cy. at 3600 rpm	10 V.A.
	N6A	48 V., 1000 Cy. at 5000 rpm	25 V.A.
	N8A	120 V., 400 Cy. at 4000 rpm	400 V.A.

DC Voltage Generator	
Model	Rating
J36	.02 V. rpm 5000 rpm max.
J36A	.02 V. rpm 1000 rpm max.

DUAL AND SINGLE SPEED HYSTERESIS SYNCHRONOUS MOTORS



1/20 • 1/50 • 1/100 HP — 2 Speed Hysteresis

A most important advantage of these motors is their ability to synchronize independently of inertia present in the load. Unaffected by load inertia and need only enough power to drive frictional component of load. Often the effect of inertia predominates to the extent that a hysteresis motor will pull the load more satisfactorily than a conventional salient pole synchronous motor of twice its hp rating. Noise and vibration extremely low. Synchronous speed—absolutely constant regardless of load variations within rating of motor and regardless of variation in line voltage. Hunt and "Wow" reduced—less speed shift due to sudden variation in load or line voltage.

PERFORMANCE (115 V.-60 Cy)

hp	Model No.	Speed RPM	Torque (oz.-in.) Start	Pull-in
1/20 (B)	93HSK-1	1800	42	30
1/50 (B)	LH731NCJ	1800	14	12
1/100 (B)	LH73QCJ	1800	7	6
1/50 1/40 (A)	LH712MNCJ	1800 3600	13 12	11 7.5
1/100 1/50 (A)	LH712NQCJ	900 1800	12 12	11 11

A—Ball Bearing B—Sleeve Bearing

LET US FIT AN E-A-D UNIT TO YOUR APPLICATION

BF 94DDL-2—CENTRIFUGAL BLOWER: 250 CFM at .5" static pressure (NAFM). 330 CFM at 0" static pressure. 1/3 HP capacitor induction motor. 120 volts, single phase, 60 cycles, 3200 RPM, clockwise or counter-clockwise rotation, rigid base, overall dimensions—8 3/8" x 7 7/8" x 9 5/8".

F3NPIS—VARIABLE FREQUENCY AXIAL BLOWER: Designed to operate 50-60 cycles and 360-1600 cycle. Features minimum change in current, power, delivery, and speed over maximum frequency range. Using 3" fan average delivery 220 CFM, average speed 6200 RPM. Overall dimensions—2" diameter x 3 1/8".

P31—ROTARY PHASE CONVERTER: Features balanced, output, stable operation, high efficiency, minimum size and weight. 115 volts, 400 cycles, 7100 RPM, rated output 40-60 watts, weight approx. 16 ounces, overall dimensions:—2" diameter x 3 3/32".

BF 94DDL-2

COMMERCIAL MOTORS

70 FRAME MOTORS

1/15 to 1/50 HP—2 and 4 pole capacitor

Recommended for applications where small size and light weight are of primary importance. Supplied in sleeve and ball bearing, end mounted, with 5/16" shaft. Capacitor motors are reversible. Condensers supplied with motors, mounted separately.

90 FRAME MOTORS

1/10, 1/12 HP—4 & 6 pole capacitor

1/15, 1/20 HP—4 pole, shaded pole

The new 90 frame motors, for use where a larger motor is required, provide ample reserve power, exceptionally cool running, and extra rugged construction for original equipment and general industrial applications. These motors can be furnished with double shaft extensions, special end caps, or windings to suit a particular application. Let us have your requirements.

Salient Pole SYNCHRONOUS MOTORS

For use in applications where motor must synchronize at fixed angular positions with respect to the shaft.

PERFORMANCE (115 V.-60 Cy)

hp	Model No.	Speed RPM	Torque (oz.-in.) Start	Pull-in
1/50 (A)	LS71NCJ	1800	9	12
1/50 (A)	KS71NCJ	3600	4	6
1/50 (B)	KS73NCJ	3600	4	6

A-Ball B-Sleeve

EASTERN AIR DEVICES, INC.

585 DEAN STREET
BROOKLYN 17, N.Y.

ELECTRICAL INSULATING TUBING & SLEEVING

We are insulation specialists — that's all we do. Naturally, we have a complete line of sleeving and tubing — Fiberglas, cotton, and extruded plastic. Listed below are most of our standard items, but if you have some special requirement, let us develop the material for your individual needs.

VARGLAS — SILICONE

Varglas-Silicone sleeving, tubing, lead wire, and tying cord are recommended for applications involving continuous operating temperatures up to 500° F combined with the following qualities:

1. Low temperature resistance in general. Good resistance to chafing and abrasion in all grades – in some grades down to – 85° F.
2. Moisture resistance, including salt water, acids and mild alkalis.
3. Flame resistance – self-extinguishing.
4. Electrical properties – excellent electrical resistance and low power factors.

Varglas-Silicone insulation is available in seven standard colors at no extra charge.

Varglas-Silicone double wall sleeving and tubing are available for special applications.

Varglas-Silicone materials are available in the following grades:

1. SILFLEX SLEEVING – Light saturation of Silicone resin on Fiberglas braid.

2. VARGLAS-SILICONE SATURATED SLEEVING – Heavier saturation of Silicone resin on Fiberglas braid. Available in 3 standard grades.

3. VARGLAS-SILICONE TUBING GRADES A AND B – Recommended for applications requiring high dielectric strength. Grade A – average 7000 volts. Grade B – average 4000 volts.

4. VARGLAS-SILICONE LEAD WIRE AND VARCHROME RESISTANCE WIRE – Single or multiple walls of Fiberglas braid with Silicone impregnation over solid or stranded copper wire or resistance wire base.

5. VARGLAS-SILICONE TYING CORD – Silicone treatment on continuous filament Fiberglas tying cord. Available in sizes from 1/64" to 1/8" O.D.

VARGLAS SLEEVING

1. VARGLAS SATURATED SLEEVING – Fiberglas braid with impregnation of oleoresinous varnish or other electric insulating material in A.S.T.M. and NEMA Grades C-1, C-2, and C-3. These three grades can also be furnished with lacquer coating if desired.

Grade C-1 – Average dielectric test – 2500 volts; minimum dielectric test – 1500 volts.
Grade C-2 – Average dielectric test – 1500 volts; minimum dielectric test – 800 volts.
Grade C-3 – No dielectric guarantee.

2. VARGLAS NON-FRAY SLEEVING – For applications where non-fraying and very high temperature endurance are of prime importance, this sleeving is ideal. It has been given a "normalizing" treatment to remove the organic impurities from the Fiberglas, and this process tends to hold the individual fibres together. Because of the absence of any bonding agent it will withstand temperatures as high as the Fiberglas itself – up to 1200° F. It is extremely flexible, yet retains its roundness, simplifying assembly operations. Used where dielectric qualities are not of prime importance.

3. VARGLAS SLEEVING TYPE RW SYNTHETIC – Fiberglas braid with a new type of coating of the oleoresinous varnish class but with higher heat resistance than the conventional varnish – up to 400° F. Very flexible. Available in Grades C-1, C-2 and C-3 sleeving and Grades A and B tubing.

VARGLAS TUBING

1. VARGLAS TUBING TYPE YS SYNTHETIC – Grade A or Grade B. It offers you maximum flexibility – even where dielectric requirements are 7000 volts and more – and yet it will withstand short time temperatures as high as 425° and 450° F. Applied on a braid made from continuous filament Fiberglas yarns, this synthetic coating prevents fraying and increases dielectric qualities, while the finished product is as flexible as extruded plastic tubing. Will not support combustion. Available in seven colors and in long lengths.

2. VARGLAS VARNISHED AND LACQUERED TUBING – Flexible, continuous coatings of flame-resistant varnish or lacquer applied over Fiberglas braid in 8 or more carefully controlled operations. Varnished tubings have thinner walls and greater heat resistance than the lacquered tubings, but are slightly less flexible. All standard grades.

Grade B-1 – Oleoresinous varnish coating. Average short time dielectric test of not less than 4000 volts and no one of ten puncturing voltages less than 2500 volts.
Grade B-2 – Lacquer coating. Same dielectric qualities as Grade B-1.
Grade A-1 – Oleoresinous varnish coating. Average short time dielectric test of not less than 7000 volts and no one of ten puncturing voltages less than 5000 volts.
Grade A-2 – Lacquer coating. Same dielectric qualities as Grade A-1.

VARGLAS PERMAFIL SLEEVING and TUBING – Fiberglas braid coated with General Electric's Permafil resin. Has superior qualities of flexibility, heat endurance, solvent resistance in addition to meeting all regular tests for oleoresinous tubings.

VARFLO SLEEVING and TUBING – Vinyl-coated Fiberglas in full range of sizes, colors and grades. Extremely flexible with very good electrical heat aging qualities. Competitively priced.

SYNTHOLVAR EXTRUDED PLASTIC TUBING

Made from a thermoplastic synthetic resin compound, this tubing is particularly suitable for applications where low temperature flexibility or resistance to fungus growth is very important. Complete data sheets available on request.

VARFLEX COTTON SATURATED SLEEVING

This sleeving is braided from long staple cotton yarns and is available in Grades C-1, C-2 and C-3. See description of the three grades under Varglas Saturated Sleeving.

VARFLEX COTTON TUBING

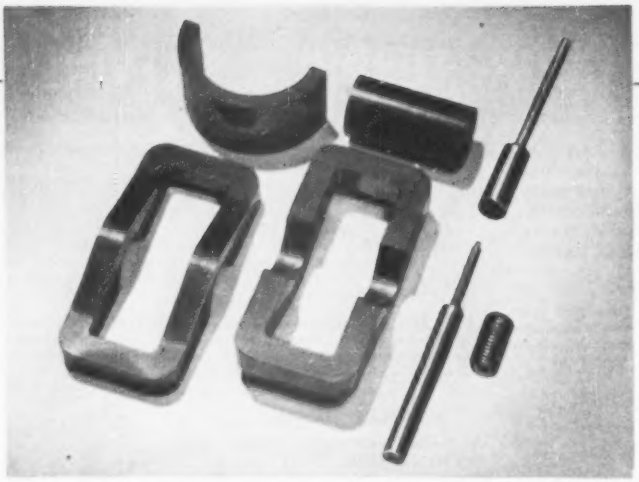
Varflex Cotton Tubing is available in the same grades as Varglas Varnished and Lacquered Tubing.

Send for our new sample folder showing our complete line. Also, our Varglas-Silicone sample folder and the NEMA Standards booklet are yours for the asking.

Varflex
CORPORATION
Makers of Electrical Insulating Tubing and Sleeving

308 NORTH JAY STREET **ROME, N. Y.**

MEMBER OF NEMA



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OAK LAWN, ILLINOIS

High Sensitivity . . Logarithmic
AC VOLTMETER
40 MICROVOLTS TO 500 VOLTS

SELF-CONTAINED
ALL AC OPERATED UNIT

An extremely sensitive amplifier type instrument that serves simultaneously as a voltmeter and high gain amplifier.

- Accuracy ±2% from 15 cycles to 30 kc.
- Input impedance 1 meg. ohm plus 15 uuf. shunt capacity.
- Amplifier Gain 40000

Also MODEL 45 WIDE BAND VOLTMETER
0005 to 500 Volts!
5 Cycles 1600 kc.

MODEL 47 VOLTMETER

A few of the many uses:

- Output indicator for microphones of all types.
- Low level phonograph pickups.
- Acceleration and other vibration measuring pickups.
- Sound level measurements.
- Gain and frequency measurements for all types of audio equipment.
- Densitometric measurements in photography and film production.
- Light flux measurements in conjunction with photo cells.

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LITTLE NECK, L. I., N. Y.

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OF EXPERTLY DESIGNED
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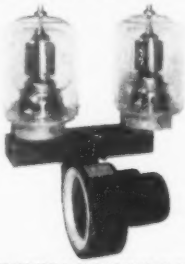
CABINET FLUSHING FANS

MINIATURE BLOWERS AND FANS



HI-PRESSURE LIGHTWEIGHT BLOWERS SPECIALLY ADAPTED TO VARIOUS TUBES

HI-VELOCITY BLOWERS MATCHED TO STANDARD TRANSMITTING TUBES

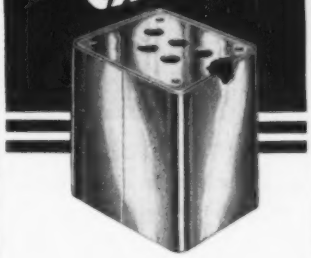
Write for complete catalogue including valuable data sheets

ROTRON MFG. CO.

ENGINEERING SALES OFFICE
7-9 Schoonmaker Lane
WOODSTOCK, N. Y.

LOJACK

TRANSFORMER CASES



FEATURES:

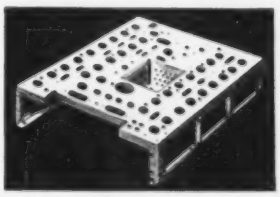
1. Sizes designed for normal requirements.
2. Rigid construction—Round corners.
3. Tight fitting inside covers for easy sealing.
4. Cases or covers available separately.
5. Mass Production means high quality at low competitive prices.
6. Lojack covers and cases can be furnished with holes pierced, reinforcing brackets, channels or strips, tapped holes, studs, weld nuts, tapped inserts, etc., to better meet your specifications.
7. Height of case variable.

Core	Length	Width	Height
EE26-27	1-1-4"	1-1-2"	2"
EI21	1-1-9"	1-3-4"	2-5-16"
EI-625	1-3-4"	2-1-8"	2-9-16"
EI-75	2-1-8"	2-7-16"	2-15-16"
EI-11	2-7-16"	2-15-16"	3-3-8"
EI-3A	2-15-16"	3-1-8"	3-11-16"
EI-12	2-7-8"	3-3-16"	3-3-4"
EI-112	3-3-16"	3-1-2"	4-1-4"
EI-195	3-1-2"	3-7-8"	4-5-8"
EI-137	3-7-8"	4-1-4"	5-1-16"
EI-13	4-1-4"	4-3-4"	5-1-2"
EI-36	4-3-4"	5-1-4"	6-3-4"
EI-175	4-7-8"	5-1-2"	6-5-16"
EI-19	5-1-4"	6-1-4"	8-1-16"

Let us quote on your short run precision sheet metal requirements.

Our model shop offers:—

- Finest workmanship
- Immediate service
- Production methods applied to your short run parts means moderate costs to you.



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LOJACK PRECISION CORP.

93 Worth St. New York 13, N. Y.
WOrth 2-7227

J-B-T

VIBRATING REED FREQUENCY METERS — **ROTARY SELECTOR SWITCHES**

Panel Mounting or Portable, for use when constant or known frequency is important to efficient operation of equipment.

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- **Rugged Construction** of simplified, patented design, with no moving parts to wear out or get out of calibration. Ideal for field and mobile applications.

Ask for Bulletins VF-43, VF-43 1A, 1B, and 1C and General Catalog 549

NEW DEVELOPMENTS

1½" and 3½"

SEALED Frequency Meters

Model 15-FHAC (illustrated half actual size), 60 and 400 cycles, 2 reeds, 8-10 volts, for cathode follower circuit. Widely used on audio oscillators to standardize output. Meets intent JAN-1-6 & amendments on sealed meters. Barrel, 1½" diameter; detachable flange, 2.094" diameter; solder terminals.

Model 15-FH (not illustrated)—same case, sealed, 5 reeds, 58-62 cycles, 100-130 volts. Variations such as 6 reeds, 25 or 400 cycle ranges and higher voltages available on special order.

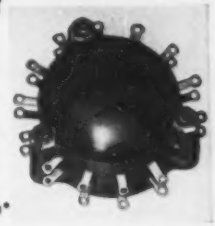
3½" Sealed Type (not illustrated)—other 5, 7, 9, 10 or 11 reed meters using metal cases with 3½" flange and solder terminals now are made on special order for Government applications and particularly adverse operating conditions. Ask for Print SK-24.

ALSO NEW

Combination Reed-Type Frequency-Elapsed Time Meters

Model 31-FE (illustrated) pioneered by J-B-T, saves panel space and cost. Useful on electrical and electronic equipment, also power units, where both frequency and periodic maintenance are important. 3¼" case, 4-9/32" overall depth standard. 3½" case, known as 31-FEX-1 supplied on custom orders. 5 reeds, 60 cycle range standard; 7, 9, 11 reeds or 50 cycle range on special order. For other details, see Elapsed Time Meters in next column.

INSTRUMENT TYPE MOLDED SWITCHES



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**Ask for Bulletin F-55 and New Bulletin on Single Deck Lever Action Switches*

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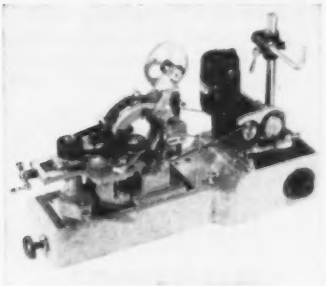

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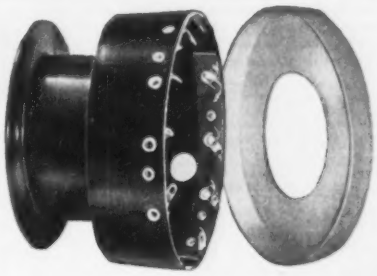

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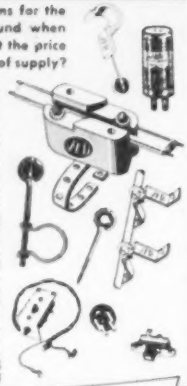

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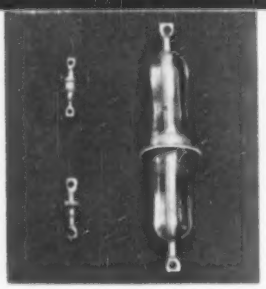

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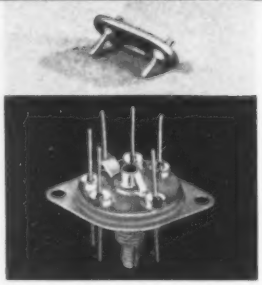

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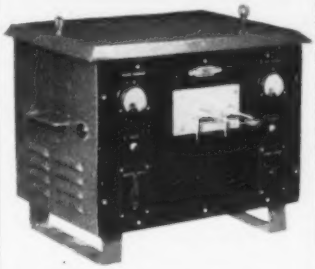

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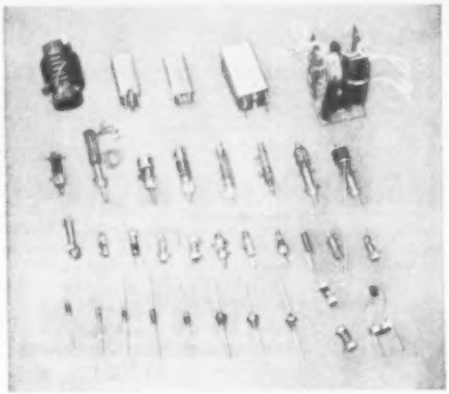

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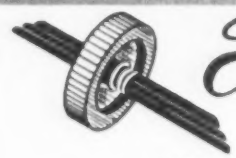

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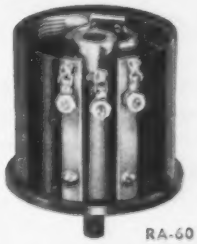

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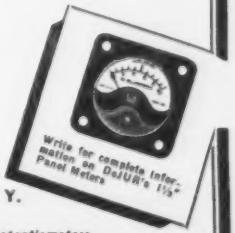

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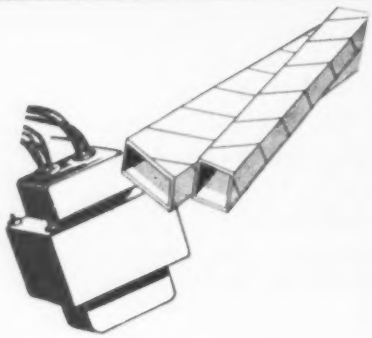

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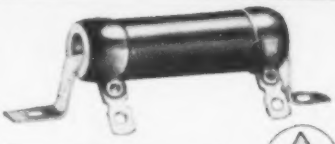

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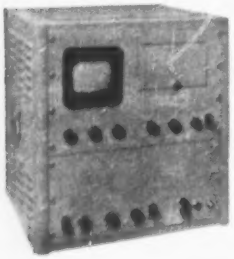

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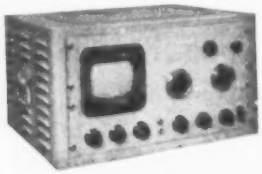

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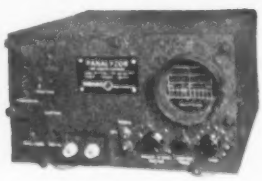

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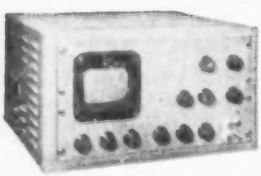

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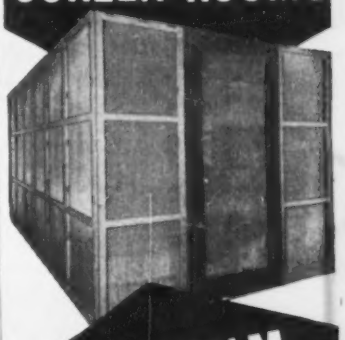

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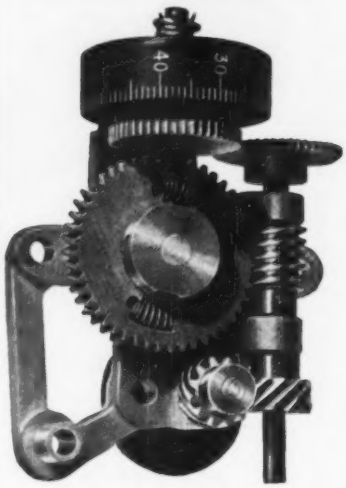

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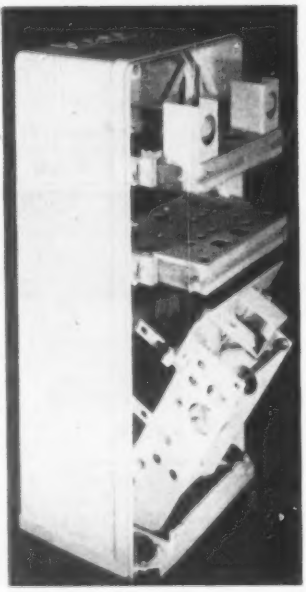

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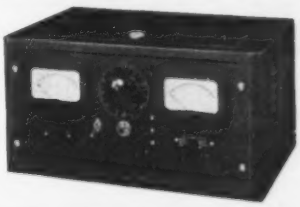

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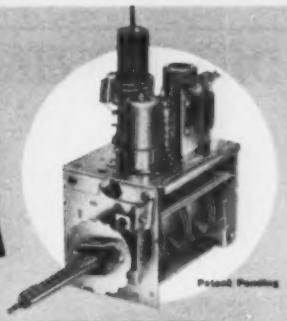

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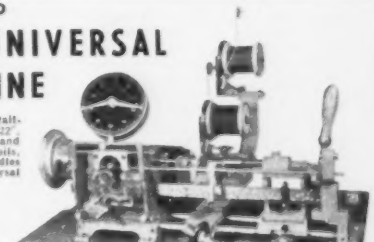

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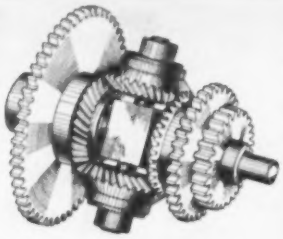

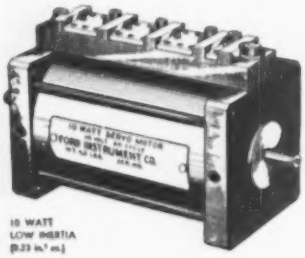

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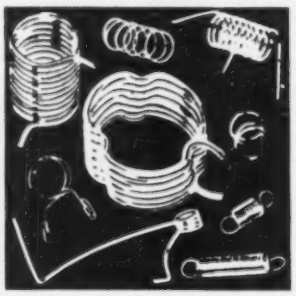

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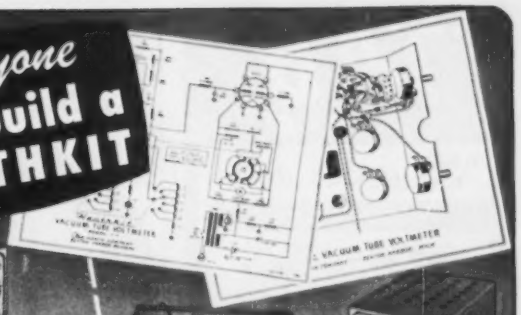

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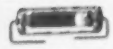

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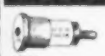

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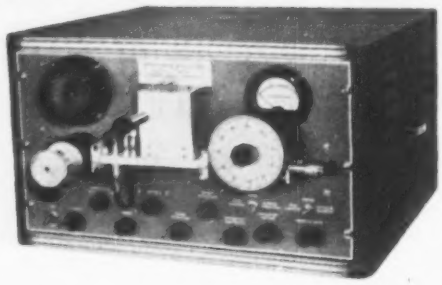

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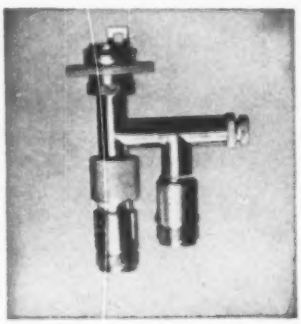

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2K29	24.95	OK59	59.00	714AY	6.95	956	.45	9004	.45
2K45 on Request		RK39	2.25	715A	6.95	957	.25	9005	1.50
2X2A	.99	RK49	2.50	715B	9.95	958A	.55	9006	.35
2V3G	.99	VR58	.29	715C	24.95	959	.75		
3A4	.75	VR95	.45	717A	.95				
3A5	.95	100TH	10.95	720AY	45.00				
3AP1	4.95	VR105	.79	720BY	45.00				
3BP1	3.95	FI23A	8.95	720CY	45.00				
3B24	1.95	VR150	.65	720DY	45.00				
3C23	3.95	VT98	39.95	721A	2.60				
3C24	.95	X99	.75						
3C31	3.95	203A	3.95						
3C45	13.95	211	.75						
3DP1A	3.25	217C	6.95						
3E29	8.95	233A	2.95						
3J31	50.00	242C	7.50						
4A1	.95	249C	2.75						
4B30	1.75	250TH	19.25						

350A is a long life WE307

350B is a long life WE65A6

WE 701A can be used for a Super 813

$10 Minimum Order

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2,000 Magnetrons, Type 714 AY at	3.75
1,000 TR Tubes, Type 1B22 at	.99
1,000 TR Tubes, Type 1B26 at	1.99
50,000 Acorn Tubes, Type 954 at	.19
50,000 Acorn Tubes, Type 957 at	.10
50,000 Acorn Tubes, Type 1625 at	.19
1,000 Klystrons, Type 723 A/B at	7.95
1,000 Rectifiers, Type 1616 at	1.00
1,000 Tubes, Type 814 at	1.95
5,000 Tubes 9001 at	.45¢
5,000 Tubes 9002 at	.29¢
5,000 Tubes 9003 at	.45¢
5,000 Tubes 9004 at	.35¢
5,000 Tubes 9006 at	.20¢
100 Magnetrons 4J38	$55.00
1,000 5D21	$10.00

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X band Pulsed Signal Generator
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TAA-11BL VSWR Measuring Amplifier. Browning
TS 33 X Band Power and Frequency Meter
TS 35 X Band Pulsed Signal Generator
TS 36 X Band Power Meter
TS 45 X Band Signal Generator
TS 146 X Band Signal Generator
TS 263 Navy Version of TS 148
X Band Magic T Plumbing
X Band Tunable Crystal Mounts
TVN-8SE MIT Klystron pulse and power Supply

S Band
TS155 S Band Signal Generator
TS3A/AP S Band Power and Frequency Meter
RF 4 Electrically Tuned S Band Echo Box
BC 1277/60ABQ S Band Pulsed Signal Generator
PE 102 High Power S Band Signal Generator

L Band
Hazeltine 1030 Signal Generator 145 to 235 Megacycles
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Measurements Corp. type 84 Standard Signal Generator
TS 47, 40 to 400 MC Signal Generator

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162C Rider Chanalyst
Short Wave Adapteur for 162C
Ferris 22A, Signal Generator

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RCA Audio Chanalyst
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Other test Equipment and Meters
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General Radio V T Voltmeter 728A
Calibrator WE 1-147
Hazeltine Pulse & Sweep Generator
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Weston Meters types 430, 429, 741
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TELETYPE METERS—TYPE 1-97-A

For use with Teletype Printer, to check line and bias currents. Zero center 3" Meter reads + 125 Volts DC and — 100 Ma. D.C. Built up in metal case 7" L x 5" H. x 4½" D. Complete with printer and line cords. Diagram in case cover. New $4.95

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Carbon; Gold Plated contacts. Completely enclosed in Black Bakelite with Solder Lug Terminals. New. 79¢ each. $70.00 per 100.

2 CONDUCTOR CORDS

2 color coded tinsel conductors enclosed in heavy rubber jacket. Extremely flexible. Leads terminated with spade and ¼" Lugs. 6½' long. New. 100 for $2.25. 500 for $8.95.

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2 W. Resistors 14,000 Ohms—6¢ each, 100 for $6.50
20 W. Candohm 5,000 Ohms—21¢ each, 100 for $16.95
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100 W. Vitreous Enamel 50,000 Ohms—79¢ each.
2 Megohm 1 Ma. 1 R.V. Ferrule Multiplier Resistor—79¢ each.

CERAMIC TUBING

Grade1 white. 1.22" Wall. ½" O.D. x 1½" L. (Approx.) New. Packed 100 per box. 49¢ Per M $3.50

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White, glazed ¾" x ¾" x 1 11/16" L. Base threaded for 8-32 screw. 2-6 Horizontal holes 11/16" from top. New. Per 100 ..... $1.19

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Solid brass with slotted screw and insulation piercing needle. Military telephone type TM-175. Stud threaded for 12-24 Nut. New. per 100 $2.45

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JIX-VRC-1. Heavy steel case with 12 conduit or HX Knockouts. Terminal Strip with brass lugs provides for 10 pairs. Stop nuts secure wires. Size: 2" x 4½" x 8". Removable Cover. New. 69¢ each, 3 for $2.00

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Weather proof; ideal for insulating TV or FM Lead-ins from Skylights and obstructions. I.D. ¼", ⅜", ½". (Specify Size) 50 Ft. any size $1.45

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TV2-501—Shot-proof. 500 Mmf. 10,000 V.D.C.W. New. 35¢ each. 10 for $4.95

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2.0 Mfd. 600 V.D.C.W. Upright Rectangular Can with Stand-offs. 1" x 1¾" x 3¾". New. 3 for 85¢, 100 for $23.50

SHOCK MOUNTS

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PUSH SWITCH

SS "D" Class 3020 Type 985 S.P.S.T. Normally closed. Cap. about 200 Amps. 12 Lbs. Actuating force, ¾" D. Push Button. Silver contacts. With mounting Holes. Size 1½" x 2⅛" x 2⅝". New, packed. 75¢ each, 10 for $6.50

SPECIAL LINE SWITCH (ROTARY)

2 ckt. 8 poles each. Double throw. 2 pos. Rated at 5 Amps. 125 V.D.C. 10 Amps. 125 V.A.C. Brass terminals with screws. Bakelite construction with metal ends. Complete with hdwe. and knob. Overall size: 2⅜" D x 3½" L. New. $1.39

VOLTAGE REGULATOR

Eclipse Carbon pile Type 1202. Style "A". Set at 115 V. Aircraft Type. New $1.29

TRANSMITTING MICA CAPACITOR

Type 1500 Ed. 21". .01 Mfd. 5000 V. DC. 10 Amps. at 2.0 Mc., 20 Amps. at 1.0 Mc. Sealed in heavy phenolic case with mounting ears. While They Last! ..... $1.85, each

SPECIAL LUGS

Solderless. Amp 40-58 Cadmium plated. For #4 wire. ¼" Hole. Box 200 ..... $2.19

Solderless TB 50A Tinned. For #5-6 wire. ¼" Hole. 1000 for $10.50

Solderless—TB 30A Tinned. For #6 wire. ⅜" Hole. 1000 for $10.50

Solder Type SH-20A Natural copper. For #4 wire. 1.22" Hole. 1000 for $10.50

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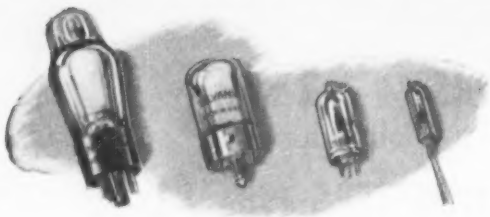
SYLVANIA RADIO AND TELEVISION TUBES



RECEIVING TUBES

Even the small parts that go into the manufacture of Sylvania radio tubes—from the famous Lock-In to the tiny subminiatures—are made by Sylvania in its own plants. Every step of the way is quality controlled. That's just one good reason why Sylvania tubes are so well known for quality and performance.

Sylvania research has brought about many important advances in radio receiving tubes, making it possible to offer you a *complete line* that is unsurpassed in quality.

TRANSMITTING TUBES

To augment its comprehensive line of top quality receiving tubes, Sylvania has marketed a line of more than 20 high quality transmitting tubes.

Typical of this comprehensive line is Sylvania's new type 5933/807W, a smaller, vibration and shock-tested version of one of the most popular amateur operators' tubes. Described as "the answer to the prayers of the ham", the 5933/807W has shorter internal leads and excellent shielding which sharply reduce parasitic oscillations and give it remarkable stability. Electrical operating ratings are identical to those of the conventional type 807.

TV PICTURE TUBES

Sylvania's complete line of high quality television picture tubes includes 17 round and rectangular types, of both glass and glass-metal construction in all popular sizes. Face plates of both clear and neutral-gray glass.

Sylvania Cathode Ray Tubes for every purpose include 20 electromagnetic types from 5-inch to 19-inch; 21 electrostatic types in screen sizes from 2-inch to 7-inch. Screen persistences from long and medium to short are available with blue, green and white fluorescence.

Write for detailed information and latest data sheets on the complete line of Sylvania Cathode Ray Tubes.

SYLVANIA ELECTRIC

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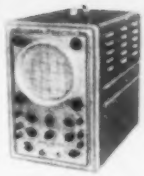
SYLVANIA TEST EQUIPMENT

Television Oscilloscope. An Exceptionally High-Gain, Wide-Band Oscilloscope Designed for Television. Accurately displays any TV pulse or wave-shape on a large, eye-saving 7" screen. Sensitivity: 0.01 v./in. Vert. response useful to 4.0 mc. Hard-tube sweeps to 50 kc; phasing control; pos. or neg. sync. control; many other outstanding features. Recommended for servicemen; laboratories; advanced schools and industry. Price: $229.50.

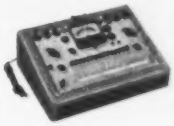


Type 400

Type 132

General Purpose Oscilloscope. A Versatile 7" 'Scope with Many Features Found in Type 400 above, priced as low as oscilloscopes with smaller screens. Sensitivity: 0.21 v./in.; freq. response: exceeds 10 cps. to 70 kc. Widely used by servicemen, schools and industry for AM-FM-TV testing. Price: $144.50.

Tube Tester Type 220. Made by a Tube Manufacturer for Tube Users, these instruments test for ALL usual faults—not just one particular characteristic. New and exclusive ohmmeter-type shorts/leakage test indicates "GOOD" or "REPLACE" directly on the illuminated meter. Gas and special heater-cathode leakage tests made in single operation. Single composite dynamic test for emission, transconductance and relative tube life. Panel-mounted roller-chart; convenient switches; provisions for future tubes. Portable Type 220 has durable metal case and handle; removable cover. Size: 6" x 11¼" x 17". Price: $99.50.



Tube Tester Type 219. The counter Type 219 is electrically equivalent to the portable type. Attractively housed in a streamlined wood and metal cabinet. Adaptable to any surroundings. Occupies small counter space. Size: 5¾" x 13" x 18¾". Price: $99.50.

TV Sweep Signal Generator. An ALL ELECTRONIC Sweep Generator for TV and FM. Fundamental center frequencies: 2-25, 20-64, 60-120, and 140-230 mc. Two adjustable sweep widths: 0-600 kc./15 mc.; excellent sweep linearity; output 0.1 v. Edge-lighted dial; simplified controls; small size: 11½" x 8½" x 7". May be used with any 'scope and marker including those shown above and below. Price: $139.50.

Type 500

Polymeter-TV Vacuum-Tube Voltmeter. A Sensitive DC, AC and RF Vacuum-Tube Voltmeter, Ohmmeter and DC Current Meter. The basic instrument for every TV, FM and AM shop. Ranges: rf to 300 volts (only 3 $\mu\mu$f shunt capacity); ac and dc to 1000 volts (10 or 30 kv dc using h.v. probes described below); dc current from 50 microamperes to 10 amperes; and resistance from 0.5 to one billion ohms. Frequency range to 300 megacycles. High input impedance on all voltage ranges. Size identical to TV generator at left. Price: $99.50.

Type 221

Type 216

FM-AM Signal Generator. *Useful as a TV Marker.* A versatile AM-FM generator, doubly useful for peaking alignment of TV and as a TV marker. Calibrated to 0.05%. Fundamentals 80 kc to 120 mc; harmonics to 240 mc. Modulation: 0-100% AM; 0-30/150/700 kc FM. 1.0 volt max. output. Low leakage. Built-in circuit for external crystal. Price $139.50.

TV High-Voltage Probes. New Quality Probes that Permit Measuring High TV Anode Voltages by increasing the dc range of Polymeters to 30,000 or 10,000 volts. Special conversion cartridge permits using 30 kv probes with ANY 1,000 volt scale 20,000 ohm/volt meter. Select correct probe from list below:

Type	Range	Use with	Price
225	30 kv	Polymeter, Type 221	$12.50
224	30 kv	Earlier Polymeters, Types 134 and 134Z	12.50
226	30 kv	Conversion cartridge for use with above Type 225 or 224 to convert ANY 20,000 ohm/volt meter with a 1000-volt scale to a kilovoltmeter	2.00
223	10 kv	Polymeter, Type 221 (shown above)	9.95
222	10 kv	Earlier Polymeters, Types 134 and 134Z	9.95

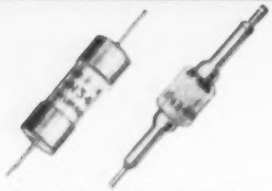
Audio Oscillator. An Accurate Sine-Wave Generator for Better Equipped Shops and Sound Specialists. Maximum output: 22.5 volts, 20-20,000 cps, flat within 2 db. Price: $129.50.

Type 145

SYLVANIA ELECTRIC

1740 Broadway, New York 19, N. Y.

CRYSTAL DIODES DUO-DIODES VARISTORS



Sylvania Germanium Diodes are long-life, lightweight, heaterless components that have found hundreds of applications in clippers, limiters, discriminators and other circuits calling for low power rectification at frequencies up to several hundred megacycles. They have low shunt capacity and no contact potential. Convenient pigtail leads eliminate the need for mounting hardware.

Sylvania Duo-Diodes consist of two matched diodes mounted in a single unit.

Sylvania Varistors, types 1N40, 1N41 and 1N42, consist of 4 specially selected and matched germanium diodes whose resistances are balanced within ±2.5% in the forward direction at 1.5 volts. Sylvania Varistor Type 1N71 consists of 4 matched low impedance diodes, each of which, with 1.0 volt impressed in the forward direction, will pass a current within 1.0 ma. of the average current of the four.

Ratings shown are for each diode.

Types 1N40, 1N42 and 1N71 are plug-in type; 1N41 is lug type.

Sylvania Silicon Diodes 1N21B, 1N21C, 1N23B, 1N25, 1N26 and 1N53 are used chiefly as first detectors in radar and other microwave superheterodyne receivers.

Type 1N22 is designed for use in microwave test probes, power indicators and other instruments.

Types 1N31 and 1N32 are used as high level video detectors.

GERMANIUM DIODES AND DUO-DIODES

Type	Cont. Reverse Working Voltage	Peak Back Voltage*	Fwd. Curr. at +1v (ma min.)	Av. Anode Current (ma max.)	Recurrent Peak Anode Curr. (ma max.)	Reverse Current (μa max.)
1N34	60v max.	75v min.	5.0	40	150	50 @ —10v
1N34A	60v max.	75v min.	5.0	40	150	50 @ —10v
						800 @ —50v
1N35**	50v max.	75v min.	7.5	22.5	60	10 @ —10v
1N38	100v max.	120v min.	3.0	40	150	6 @ —3v
						625 @ —100v
1N39	200v max.	225v min.	3.0	40	150	200 @ —100v
						800 @ —200v
1N54	35v max.	75v min.	5.0	40	150	10 @ —10v
1N55	150v max.	170v min.	3.0	40	150	300 @ —100v
						800 @ —150v
1N56	40v max.	50v min.	15.0	50	200	300 @ —30v
1N57	80v max.	90v min.	4.0	40	150	500 @ —75v
1N58	100v max.	115v min.	4.0	40	150	800 @ —100v
1N58A	100v max.	115v min.	4.0	40	150	800 @ —100v
1N60	25v max.	30v min.	†	40	150	†

*For zero dynamic resistance.

**Duo-diode consisting of two units matched in the forward direction at +1v so that the current flowing through the higher resistance unit is within 10% of that in the lower resistance unit. Ratings shown for each diode.

†Units are tested in a circuit employing an input of 1.8 volts rms. at 40mc, 70% modulated at 400 cycles. Demodulated output across a 4700 ohm resistor by a .5 mmf. capacitor is a minimum of 1.2 volts peak-to-peak.

GERMANIUM VARISTORS

Type	Cont. Reverse Working Voltage	Peak Back Voltage*	Fwd. Curr. at +1.5v (ma min.)	Av. Anode Current (ma max.)	Recurrent Peak Anode Curr. (ma max.)	Reverse Current (μa max.)
1N40	25v max.	75v min.	12.75	22.5	60	50 @ —10v
1N41	25v max.	75v min.	12.75	22.5	60	50 @ —10v
1N42	50v max.	120v min.	12.75	22.5	60	6 @ —3v
						625 @ —100v
1N71	25v max.	75v min.	66 (@ 1.0v)	50	200	300 @ —30v

*For zero dynamic resistance.

SILICON DIODES

Type	Design Freq. (mc)	Max. Conv. Loss (db)	Max Output Noise Ratio	Burnout Test	I. F. Imp. (ohms)
1N21B	3,000	6.5	2.0	Bs=2.0 erg	200-800
1N21C	3,000	5.5	2.0	Bs=2.0 erg	200-800
1N22	9,000	—	—	Bs=0.3 erg	200-800
1N23B	10,000	6.5	2.7	Bs=0.3 erg	150-600
1N25	1,000	8.0	2.5	Bp=6.5 watts	100-400
1N26	25,000	8.5	2.5	Bs=0.1 erg	300-600
1N29		Obsolete—use 1N21B			
1N53	35,000	8.5	2.5	Bs=0.15 erg	400-800

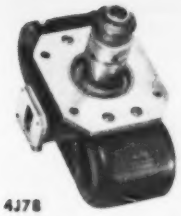
Type	Min. Fig. of Merit	Video Imp. (ohms)	Burnout Test	Carrier Freq. (mc)	Video Freq.
1N27		Obsolete—use 1N32			
1N30		Obsolete—use 1N31			
1N31	55	6,000-23,000	Bp=0.02 watt	10,000	500 cps—5 mc
1N32	100	5,000-20,000	Bp=0.36 watt	3,000	500 cps—5 mc

Bs=total energy in simulated spike of pulse from TR box in radar service.
Bp=peak power pulse under pulsed conditions.

SYLVANIA ELECTRIC
1740 Broadway, New York 19, N. Y.

MICROWAVE COMPONENTS

MAGNETRONS



4J78

The Sylvania family of Magnetrons operates in the shf band at peak power levels ranging from 7 to 300 kw and at average power ranging from 14 to 300 watts. 2J42 and 2J42A are of the vane type; 3J31, rising sun; 4J50, 4J52 and 4J78, hole and slot. All except 3J31 are supplied with magnet. Write for bulletin EC-37.

Type	Frequency Range (mc)	Pulsed Power Out (kw)	Avg. Power Out (watts)
2J42	9345-9405	7-14	14
2J42A	9345-9405	18-35	18
3J31	23,744-24,224	30-54	15-27
4J50	9345-9405	300	200
4J52	9345-9405	65-120	65
4J78	9003-9168	300	200

ROCKET TUBES

2C36

Sylvania Rocket Tubes are planar-electrode disc-seal triodes for use as oscillators and amplifiers at frequencies up to 3300 mc. Design permits broad band operation. Tuning is simpler and covers a greater continuous range than that of many other types of uhf tubes.

2C36 is a pulse-modulated oscillator for frequencies up to 1200 mc.

2C37 is designed for use as a c.w. oscillator up to 3300 mc. Plate disc is flat, grid disc folded.

5764 is a pulse-modulated oscillator for use up to 3300 mc.

5765 is for use as a c.w. oscillator without external feedback in the range from 900 to 3000 mc.

5766 is a c.w. oscillator for use up to 3300 mc. Plate disc is folded, grid disc flat.

5767 is a c.w. oscillator for use up to 3300 mc. Both discs are folded.

5768 is intended for use as a c.w. amplifier-multiplier up to 3000 mc.

For complete information, write for bulletin ES-4810.

TR's and ATR's

1B63A

Sylvania TR and ATR Tubes are used chiefly as automatic electronic transmit-receive switches in radar equipment. Major characteristics of some of the more commonly used types are shown in table. For full data on complete line, write for bulletin ES-21C.

Type	Frequency Range (mc)	Insertion Loss (db)	Max. Recovery Time (μsec. at −3 db)
1B24	8490-9600	0.85-1.50	4
1B63	8565-9487 (1)	0.8	4
1B63A	8490-9578 (2)	0.8 max.	4
	8565-9487 (3)		

Type	Frequency Range (mc)	Transmitter Peak Power (kw min.)	Tuning Susceptance (mhos)	Arc Loss (db. max.)
1B35	9000-9600	5	−.06 to +.06	0.8

(1) 1.6 VSWR. (2) 1.9 VSWR. (3) 1.4 VSWR.

KLYSTRONS

Sylvania Types 6BL6 and 6BM6 are intended for use as c.w. oscillators. They are of the separate cavity type, with oscillation frequency depending chiefly on external tuning. 5836 and 5837 are suitable for either c.w. or pulsed operation. Data sheets are available.

6BL6

Type	Mode	Frequency Range (mc)
6BL6	1¾	1600-4000
	2¼	2100-4500
	3¼	4000-5500
6BM6	1¾	550-2300
	2¼	1100-3000
5836	1¾	1600-4000
	2¼	2100-4500
	3¼	4000-5500
5837	1¾	550-2300
	2¼	1100-3000

HYDROGEN THYRATRONS

4C35

Sylvania Hydrogen Thyratrons are designed for pulsing service at high repetition frequencies, high peak currents and high voltages. An outstanding feature is very short deionization time, which permits an unusually high switching rate.

For information on ratings and operating characteristics, write for Data Sheets EC-24 and EC-25.

5C22

SYLVANIA ELECTRIC

1740 Broadway, New York 19, N. Y.

INDUSTRIAL ELECTRONIC TUBES

FLASH TUBES

R4340

Sylvania Flash Tubes, used with suitable equipment, provide blue-white flashes of intense brilliance and extremely short duration. They find extensive use in flash photography, and may also be used in beacons, obstruction markers and signaling devices.

Type R4330 has a maximum rate of 6 flashes a minute, with a peak light output of 12,000,000 lumens and an integrated output of 3,500 lumen-sec. per flash.

Flashing rate of the R4340 is 4 per minute maximum, peak light output 12,000,000 lumens, integrated output 18,000 lumen-sec. per flash.

STROBOTRONS & TRIGGERTUBES

Sylvania Strobotrons provide a means of "freezing" the motion of rotating or reciprocating machinery. Type 1D21/SN4 produces neon-red flashes at rates up to 240 per second. SA-309 and R4350 produce bluish-white light pulses, and are ideal for application where true-color viewing is essential. Maximum flashing rate of the R4350 is 15 per second; of the SA-309, 100 per second.

Triggertube Type 0A5 provides a convenient means of triggering any of the above Strobotrons from very low current sources. Type 0A5 may also be used for other electronic relay and for regular Strobotron purposes.

1D21/SN4

GLOW MODULATOR TUBES

Light output of Sylvania Glow Modulator Tubes varies in an essentially linear manner with the current passing through the tubes. Tubes are of the crater type, providing high ionization density.

R1130B

	R1130B	R1131A
Operating Voltage, max.	130	135
Operating current, ma	5-35	3-25
Modulating Freq. Range, cps	15-15,000	15-15,000
Useful Light Range, Angstroms	3,500-6,500	3,500-6,500
Crater Diameter, inches	.056	.093

GERMANIUM DIODE APPLICATIONS BOOK

Sylvania's "40 Uses for Germanium Diodes" is the most complete collection of germanium diode applications ever published. Simplified circuits, time-saving devices, interesting instruments and gadgets using germanium diodes are completely described and diagrammed. Price $1.00. Special bulk rates for distributors.

GAS PRESSURE MEASURING TUBES

Sylvania Pirani Tube R1111 is used for measuring gas pressures in vacuum systems. Useful range of the tube is from 1 to 1,000 microns of Hg.

Tube operates on 1.5 volts. Cold resistance is 6.6 ohms. Hot resistance in an evacuated tube at 100 ma current is from 15.5 to 17.0 ohms.

Also available is Type R1111M, which consists of a pair of matched tubes Type R1111.

R1111

MISCELLANEOUS TUBES

SS501 Gas Discharge Tube

This tube is of the externally triggered, cold cathode type, for use as an electronic switch capable of handling high instantaneous currents in high voltage circuits.

SD-759A Ramberg Accelerometer

The Accelerometer is an electronic tube useful in measuring linear acceleration. Its operating range is from 1 to 50 g's. Operates at plate voltage of 10 volts per plate.

X-6090 Ionization Tube

The Sylvania X-6090 Ionization Tube has an ozone output of approximately 5 mg per hour under typical operating conditions. Operating voltage is approximately 3,500 volts ac.

SYLVANIA ELECTRIC

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REFERENCE SHEET SECTION

POPULAR FEATURE of ELECTRONICS since the first issue of this magazine has been its Reference Sheets, pages that constitute graphical and tabular shortcuts for engineers who design, produce, install and maintain equipment.

Presented in the following pages are 21 of the sheets that have proven generally useful. Many of these have been revised. In addition, we have included a complete index of all those that have appeared since April 1930

The Editors

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VECTOR COMPUTATIONS

Aids in transforming rectangular to polar coordinates, and for determining the reciprocal of a complex number. Number of operations involved is much less than with alternative sliderule methods, particularly when working with multimesh networks. Range of charts is easily extended

By PAUL W. KLIPSCH

THE practical use of complex quantities in electrical engineering is almost as old as the profession itself. The charts presented here aid in performing two important vector operations. Fig. 1 transforming an equation in rectangular coordinates, $z = x + jy$, to its polar form, $a \angle b$, and vice versa. Figure 2 is useful in determining the reciprocal of a complex number, that is in solving the equation

$$x + jy = (a + jb)^{-1}$$

Of course the sliderule can be used in solving these problems, but the number of operations can become rather numerous.

Getting the Vector Sum

Consider the problem of finding z in the equation

$$x + jy = z$$

The absolute value of z (written $|z|$) is readily found in two operations on a sliderule as follows: On the C and D scales take the ratio of x and y such that the ratio, greater than unity, appears on the D scale at the index mark on the slide. Opposite this ratio find its square on the A scale, add one, run the slide up to this new point, and under x or y, whichever is the smaller, on the C scale will be found $|z|$ on the D scale. For example, take $3 + j4$. Set 3 on the C scale opposite 4 on the D scale which places the slide index at 1.333 on the D scale and 1.778 on the A scale. Add 1 and run the slide index up to 2.778 on the A scale. Under 3 on the C scale find the answer, 5, on the D scale. This is in effect a solution of the equation

$$|z| = (x^2 + y^2)^{1/2} = y[(x/y)^2 + 1]^{1/2}$$

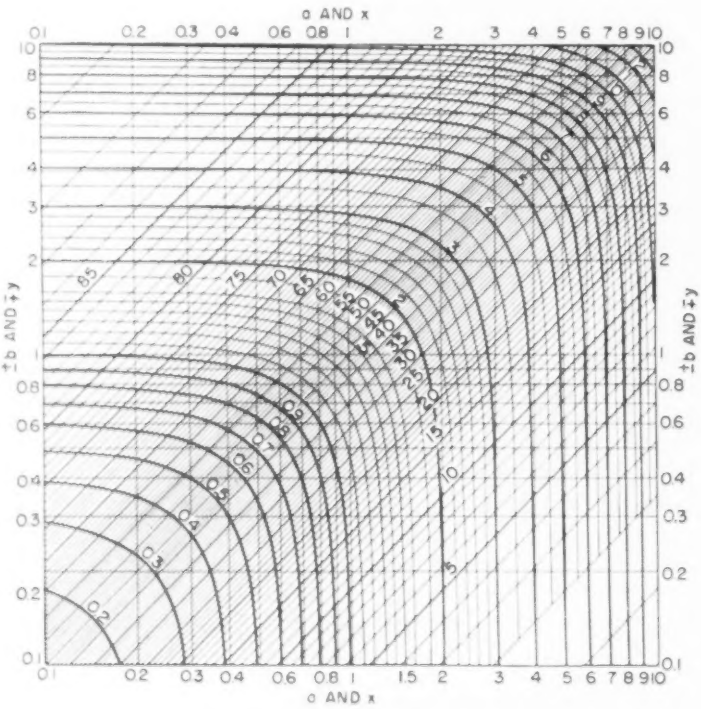


FIG. 1—Graph for converting a complex number from rectangular to polar coordinates and vice versa. The x and y axes are spaced logarithmically, the curved lines represent the argument a, the straight lines from lower left to upper right give the phase angle, b

Finding the phase angle involves the additional operation of determining the value of the impedance angle, $\angle z = \tan^{-1} y/x$.

Using Chart for Vector Sum

An alternate of the sliderule method is the use of the chart of Fig. 1 in which a transformation from rectangular to polar coordinates is performed in a single operation. The modulus and argument (absolute value and phase angle) can be found from the x and y components or the reverse operation can be performed. For example, locating the point (3, 4) on the rectangular system gives $z = 5$ on the curved coordinates and $\angle z = 53$ deg on the diagonal coordinates.

For a series of operations in solving a multimesh network, the multiplicity of sliderule steps become tedious, but the chart of Fig. 2 gives each reciprocal in a single operation. The vector reciprocal is the solution of the equation

$$x + jy = (a + jb)^{-1}$$

and the solution by means of the chart is simply that of looking up the numbers a and b on the rectangular system and then finding the coordinates of the same point (a, b) on the curvilinear system which are x and y, the sign of y being reversed with respect to the sign of b.

Extending the Range

When the ratio of a to b lies outside the range 1/10 to 10 a simple approximation may be used, and when the numbers are otherwise off the chart a factor of ten or power of ten may be applied to the number to arrive at a value locatable on the chart, looking up the converted value on the chart and applying the same factor to the answer. To use the $3 + j4$ example again, the reciprocal is found to be $0.12 - j0.16$. As an example of a complex number outside the scale of the chart, take $30 + j40$. Using a factor 1/10, $(30 + j40)/10 = 3 + j4$ and the reciprocal is $(1/10) \times (0.12 - j0.16) = 0.012 - j0.016$. For the case in which the ratio of a and b is greater than 10, the chart is not needed to arrive at a close approximation. For example, let $a + jb = 3 + j40$. The reciprocal is $3/40^2 - j1/40 = 3/1600 - j1/40 = 0.00188 - j0.025$ within less than 1 percent, the true value being close to $0.00187 - j0.0249$.

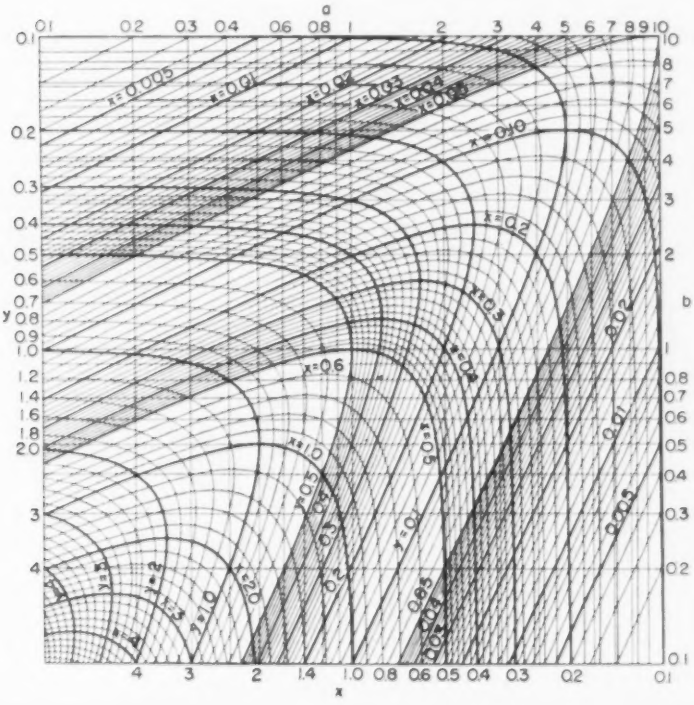


FIG. 2—For determining the reciprocal of a complex number. As an example, the reciprocal of $z = a + jb = 3 + j4$ on the a and b scales (top and right) is found to be $z^{-1} = x - jy = 0.12 - j0.16$ on the x and y scales (bottom and left)

SQUARE ROOT of a COMPLEX NUMBER

Tedious and time-consuming calculations required in finding the square root of a complex number in transmission line and filter calculations can be greatly simplified through the use of this graph

By ROBERT G. NISLE

In designing certain types of electrical networks the need frequently arises for evaluating the square root of a complex number such as an impedance. If the impedance is expressed in polar coordinates any root can be quickly and easily found, but if the expression is originally given in rectangular coordinates, the required operations are tedious and time consuming. The impedance must first be converted from rectangular to polar form, the square root is then determined, and finally the result is reconverted into rectangular coordinates, thereby requiring three separate and distinct operations.

A method by which the square root of any complex number, expressed in rectangular coordinates, can be easily and quickly determined, also in rectangular coordinates, is given here. The errors to be expected are simply those which result from reading any graph and are negligible for most engineering purposes.

To Extend the Range

If it is necessary to consider ranges outside that covered by the graph, this can be done by multiplying the original complex number by some suitable scale factor (such as 0.01 or 100) so that the problem may be fitted into the range for which the chart is drawn. The final result will then have to be multiplied by the reciprocal of this scale factor (for example, 100 or 0.01, respectively).

If the original complex number is

$$Z = a + jb$$

the problem before us is to determine

$$Z^{\frac{1}{2}} = x + jy$$

The double set of coordinates relate the quantities x, y, b, and $K = a/b$ so that when any two are known, their intersection determines a position or point on the chart from which the remaining two quantities may be determined. To use the chart, first determine $K = a/b$. Then, knowing K and b, find the intersection of these two coordinates on the vertical and horizontal axes. The point of intersection thus found will also be the point of intersection for the desired values of x and y, read off from the slanting scale.

It should be noted that $Z^{\frac{1}{2}}$ has two roots, a positive root and a negative root. Geometrically, these two possibilities are indicated in graphical form by means of vectors which are directed in opposite directions, or are 180 deg apart. The physical requirements of the problem must be considered when deciding which of the two roots is to be used.

Example 1: Assume that we have an impedance

$$Z = a + jb = 15 + j20$$

and that it is required to determine

$$Z^{\frac{1}{2}} = x + jy$$

First determine $K = a/b = 0.75$. Locate the intersection of the coordinates, $K = 0.75$ and $b = 20$. At this point read $x = 4.46$ and $y = 2.25$. The desired result is then

$$Z^{\frac{1}{2}} = x + jy = 4.46 + j2.25$$

or its negative value,

$$Z^{\frac{1}{2}} = -x - jy = -4.46 - j2.25.$$

Example 2: If the complex number is

$$Z = -15 + j20$$

the result is

$$Z^{\frac{1}{2}} = x + jy = 2.25 + j4.46$$

or, alternatively

$$Z^{\frac{1}{2}} = -x - jy = -2.25 - j4.46.$$

Example 3: If the impedance is

$$Z = -15 - j20$$

the final result is

$$Z^{\frac{1}{2}} = -2.25 + j4.46$$

or

$$Z^{\frac{1}{2}} = 2.25 - j4.46$$

Example 4: If the impedance is

$$Z = 15 - j20$$

the final result is

$$Z^{\frac{1}{2}} = 4.46 - j2.25$$

or

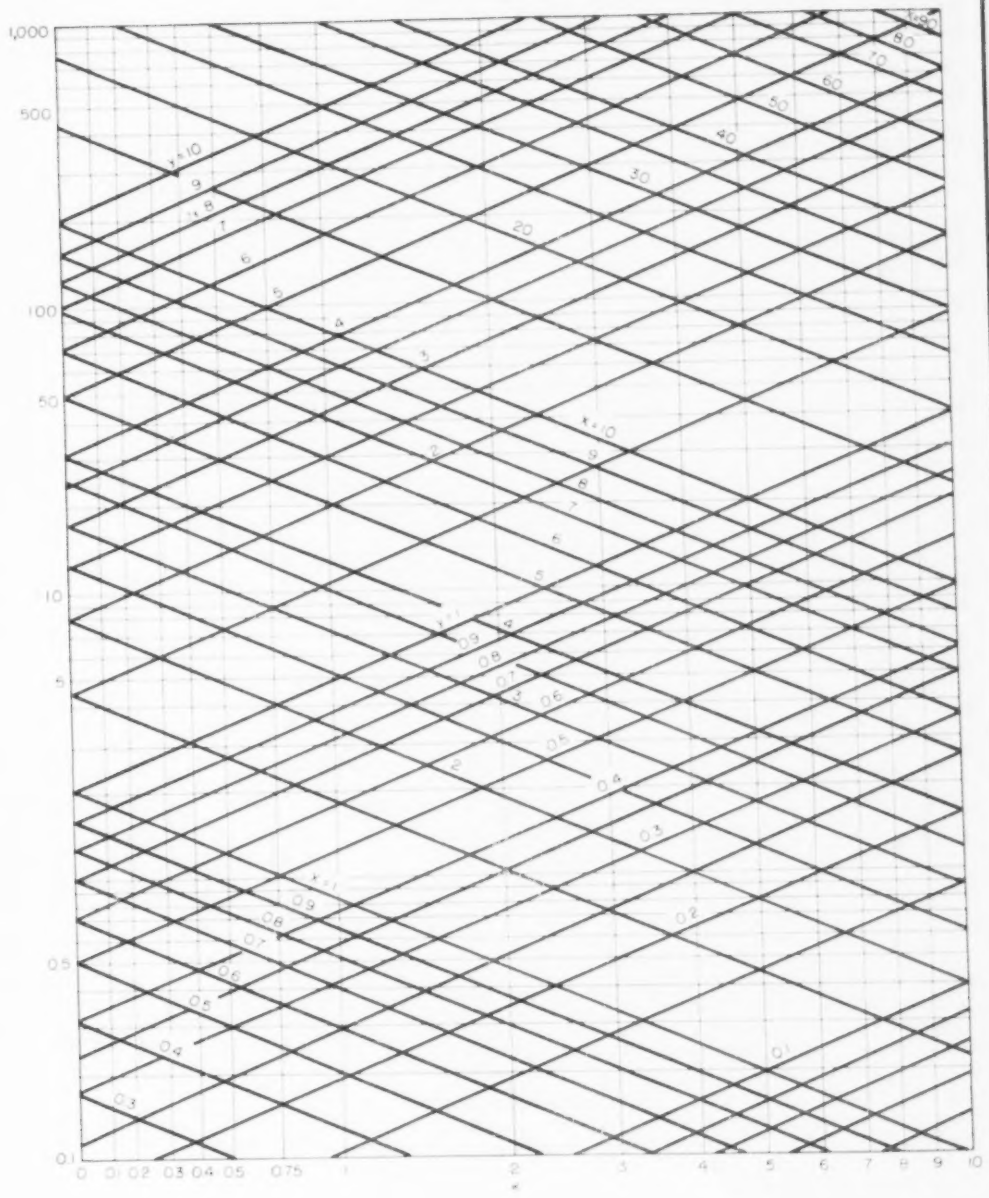
$$Z^{\frac{1}{2}} = -4.46 + j2.25.$$

Example 5: If the impedance is

$$Z = 150 + j200$$

we find that $K = 0.75$, $b = 200$, $x = 14.2$ and $y = 7.1$. The result is

$$Z^{\frac{1}{2}} = 14.2 + j7.1$$


1,000
500
100
50
10
5
1
0.5
0.1
0 0.1 0.2 0.3 0.4 0.5 0.75 1 2 3 4 5 6 7 8 9 10
X
X=10
9
8
7
6
5
4
3
2
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
90
80
70
60
50
40
30
20

REVERBERATION-TIME NOMOGRAPHS

By R. C. COILE

REVERBERATION TIME is the length of time required for the intensity of a sound to drop to one-millionth of its original intensity, which corresponds to a change of 60 db. The reverberation time of a room may be computed, knowing the dimensions of the room and the acoustical absorption coefficients of the different surfaces, from

$$T = \frac{0.049\,V}{A \log_e \left(\frac{1}{1-a} \right)} \qquad (1)$$

where T is the reverberation time in seconds, V is the volume of the room in cubic feet, A is the total surface area in square feet, a is the average absorption coefficient of the room and is equal to $(A_1 a_1 + A_2 a_2 + \ldots)/(A_1 + A_2 \ldots)$, and a_1 is the absorption coefficient of area A_1.

This expression may be simplified into an approximate expression accurate enough for the calculation of reverberation time of most rooms

$$T = 0.049 \frac{V}{a} \qquad (2)$$

where V is the volume of the room in cubic feet and a is the number of absorption units in the room computed by adding the absorption of each surface: $a = A_1 x_1 + A_2 x_2 \ldots$.

Two nomographs have been designed to facilitate rapid calculations of reverberation time. The number of absorption units in a room may be found by using the acoustical absorption nomograph in Fig. 1. Then, knowing the absorption units and the volume, the reverberation time is given by the reverberation-time nomograph in Fig. 2.

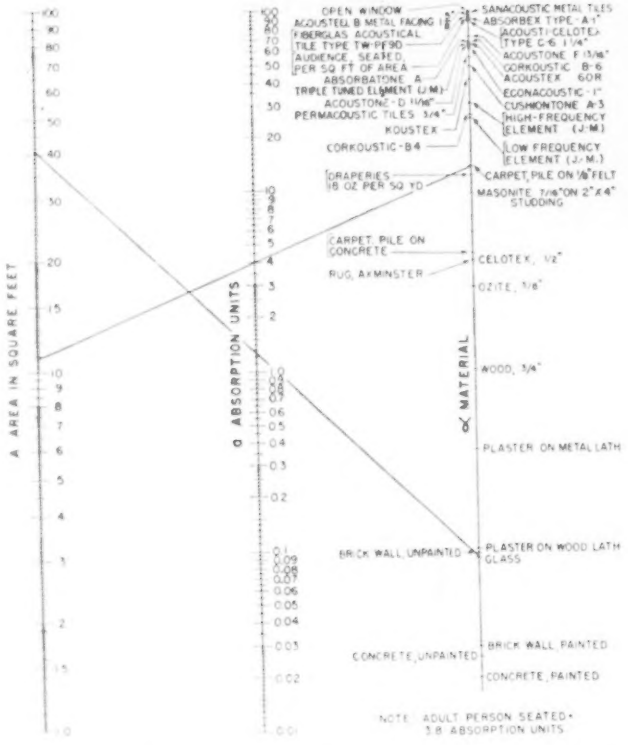


FIG. 1—Acoustical absorption nomograph based on $a = Ax$, where x is the acoustical coefficient of the material

Example

Find the reverberation time of a room 9 ft wide and 12 ft long, with a ceiling height of 8 ft. The walls and ceiling are of plaster on wood lath. One wall has a window 4 ft by 5 ft. Another wall has a glass door 3 ft by 7 ft. The floor is covered with a pile carpet on ½-in. felt. One adult person is in the room.

(a) Compute areas in sq ft, as follows:

Carpet	$9 \times 12 =$	108	floor
Glass	$4 \times 5 =$	20	window
	$3 \times 7 =$	21	door
		41	
Plaster	$9 \times 12 =$	108	ceiling
	$8 \times 12 - 21 =$	75	wall minus door

Areas of materials in room are measured and number of absorption units of each material is found with first nomograph. Total absorption units are then combined with room volume on second nomograph to obtain directly the reverberation time in seconds

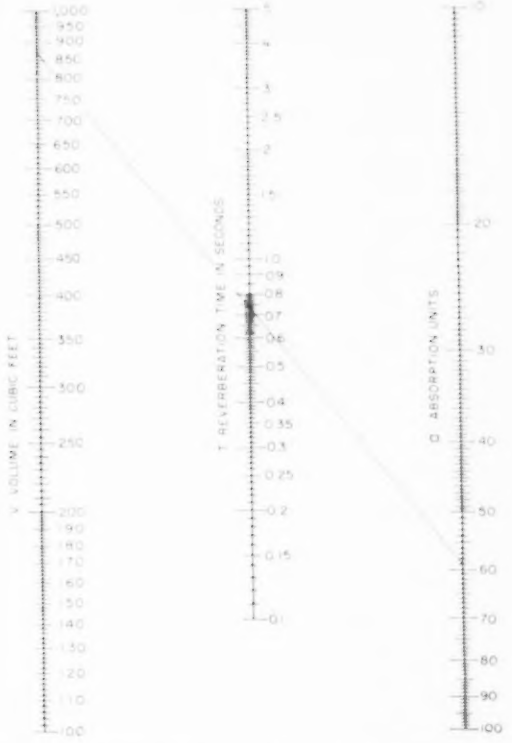


FIG. 2—Reverberation time nomograph, based on $T = 0.049\ V/a$. From Fig. 1, a may be obtained graphically

$9 \times 8 = 72$ wall
$9 \times 8 = 72$ wall
$(8 \times 12) - 20 = 76$ wall minus window
403

(b) Compute absorption units, by first laying a straightedge between 41 on the area scale and glass on the material scale of the acoustical absorption nomograph in Fig. 1. Read the answer of 1.2 absorption units at the intersection of the straightedge with the absorption-units scale.

(The range of this nomograph can be extended by multiplying the area scale and the absorption-unit scale by the same factor, such as 10. For example, to find the absorption units of the carpet area of 108 sq ft, connecting a line between 10.8 on the area scale and carpet pile on ½-in. felt on the material scale gives 4.0 absorption units. Multiplying 4.0 by a factor of 10 gives the answer of 40.0 absorption units.)

Similarly, 13.3 absorption units are obtained for 403 sq ft of plaster on wood lath, and 3.8 absorption units constitute the allowance for one person. Adding then gives a total of 58.3 absorption units.

(c) Compute volume of room: $9 \times 12 \times 8 = 864$ cu ft.

(d) Compute reverberation time by laying a straightedge between 864 on the volume scale and 58.3 on the absorption-units scale of the reverberation-time nomograph in Fig. 2. Read the answer of 0.72 sec at the intersection of the straightedge with the reverberation-time scale.

Extending the Range

The range of the reverberation-time nomograph may be extended by multiplying the volume and time scales by the same factor, such as 10, or by multiplying the absorption scale by a factor such as 10 and the time scale by the factor's reciprocal, 1/10.

The acoustical-absorption nomograph was designed by using acoustical coefficients for 512 cycles. For more accurate computations of reverberation time at other frequencies, acoustical coefficients for those frequencies should be employed. The effect of humidity should also be taken into consideration.

REFERENCE

(1) Philip M. Morse, "Vibration And Sound," McGraw-Hill Book Co., p 361.

WAVELENGTHS of SOUND

By BERTHA W. HENVIS

THE TABLES give the longitudinal bar and bulk velocities of sound in various solids, as well as the velocity of sound in some liquids and gases.

The effective velocity of sound, V, to be used in these calculations is a rather complex function of the exciting frequency and the shape and dimensions of the vibrating element. Very few three-dimensional elastic solid problems have been studied in detail, but the following comments may be used as a guide in obtaining an approximate value of the effective velocity in the elements of many vibrating systems.

For cylindrical elements of approximately circular or square cross-section, with free sides, the effective velocity varies with the ratio of diameter to wavelength as illustrated by Fig. 1A, where V_l is the bulk velocity, V_l is the long bar velocity and V_s is the minimum velocity. For most metal backing materials the ratio V_s/V_l is about 0.65.

Velocity of Sound in Solids

Material	Longitudinal Bar Velocity in cm per sec	Plate (Bulk) Velocity in cm per sec
Aluminum	5.24×10^5	6.1×10^5
Antimony	3.40×10^5	
Bismuth	1.79×10^5	2.18×10^5
Brass	3.42×10^5	4.25×10^5
Cadmium	2.40×10^5	2.78×10^5
Constantan	4.30×10^5	5.24×10^5
Copper	3.58×10^5	4.6×10^5
German Silver	3.58×10^5	4.76×10^5
Gold	2.03×10^5	3.24×10^5
Iridium	4.79×10^5	
Iron	5.17×10^5	5.85×10^5
Lead	1.25×10^5	2.1×10^5
Magnesium	4.9×10^5	
Manganese	3.83×10^5	4.66×10^5
Nickel	4.76×10^5	5.6×10^5
Platinum	2.80×10^5	3.96×10^5
Silver	2.64×10^5	3.60×10^5
Steel	5.05×10^5	6.1×10^5
Tantalum	3.35×10^5	
Tin	2.73×10^5	3.32×10^5
Tungsten	4.31×10^5	5.46×10^5
Zinc	3.81×10^5	4.17×10^5
Cork	0.50×10^5	
Crystals, quartz, X-cut	5.41×10^5	5.72×10^5
ADP ($NH_4H_2PO_4$), 45° Z-cut	3.28×10^5	4.92×10^5
Rochelle Salt, 45° Y-cut	2.47×10^5	
Rochelle Salt, 45° X-cut	See Fig. 2	
Rochelle Salt, L-cut		5.36×10^5
Tourmaline, Z-cut		7.51×10^5
CaF$_2$ (fluorite), X-cut	6.74×10^5	7.18×10^5
NaCl (Rock salt), X-cut	4.51×10^5	4.78×10^5
NaBr, X-cut	2.79×10^5	3.2×10^5
KCl (sylvite), X-cut	4.13×10^5	4.38×10^5
KBr, X-cut	3.30×10^5	3.48×10^5
Glass, heavy flint	3.49×10^5	3.76×10^5
extra light flint	4.53×10^5	4.80×10^5
heaviest crown	4.71×10^5	5.26×10^5
crown	5.30×10^5	5.66×10^5
quartz	5.47×10^5	5.57×10^5
Gelatin	1.95×10^5	
Ivory	3.01×10^5	
Marble	3.81×10^5	
Slate	4.51×10^5	
Wood, elm	1.01×10^5	
oak	4.1×10^5	

Velocity of Sound in Liquids

Material	Temperature in deg C	Velocity in cm per sec
Alcohol, ethyl	12.5	1.24×10^5
	20	1.17×10^5
Benzene	20	1.32×10^5
Carbon bisulfide	20	1.16×10^5
Chloroform	20	1.00×10^5
Ether, ethyl	20	1.01×10^5
Glycerine	20	1.92×10^5
Mercury	20	1.45×10^5
Pentane	18	1.05×10^5
	20	1.02×10^5
Petroleum	15	1.33×10^5
Turpentine	3.5	1.37×10^5
	27	1.28×10^5
Water, fresh	17	1.43×10^5
Water, sea	17	1.51×10^5

Velocity of Sound in Gases

Material	Temperature in deg C	Velocity in cm per sec
Air	0	0.331×10^5
	20	0.343×10^5
Argon	0	0.319×10^5
	300	0.307×10^5
Ammonia gas	0	0.415×10^5
Carbon dioxide	0	0.259×10^5
Carbon monoxide	0	0.338×10^5
Chlorine	0	0.206×10^5
Deuterium (heavy hydrogen)	0	0.890×10^5
Ethane	10	0.308×10^5
Ethylene	0	0.317×10^5
Hydrogen	0	1.28×10^5
Hydrogen bromide	0	0.200×10^5
Hydrogen chloride gas	0	0.296×10^5
Hydrogen iodide	0	0.157×10^5
Hydrogen sulfide	0	0.289×10^5
Helium	0	0.97×10^5
Methane	0	0.430×10^5
Neon	0	0.435×10^5
Nitric oxide	10	0.324×10^5
Nitrogen	0	0.334×10^5
	20	0.351×10^5
Nitrous oxide	0	0.26×10^5
Oxygen	0	0.316×10^5
	20	0.328×10^5
Sulphur dioxide	0	0.214×10^5
Water vapor	0	0.401×10^5
	100	0.405×10^5

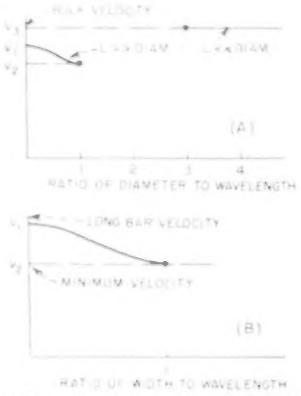


FIG. 1—Variation of velocity of sound with dimensional ratios of solids

The velocity of sonic or ultrasonic energy varies over a range of 50 to 1, depending on the medium. Once velocity is determined, by using the table below, the wavelength for any frequency from 10 cycles to 100 megacycles can be found on the nomograph

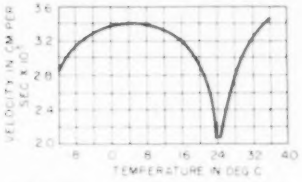


FIG. 2—Variation of longitudinal velocity in 45-degree X-cut Rochelle-salt crystal with temperature

For rectangular elements with free sides whose thickness is less than the width, the effective velocity for the element vibrating in extension (not thickness) varies with the ratio of width to wavelength as illustrated by Fig. 1B. Crystals are usually of such size that this curve is applicable. The ratio V_e/V_l can be taken as equal to 0.8 for most of the cuts of crystals in general use.

Constraints on the sides of the cylindrical elements have the effect of increasing the ratio of diameter to wavelength. Similarly, constraining the sides of rectangular elements increases the effective ratio of width to wavelength.

The velocity for a zero diameter-to-wavelength ratio is the long bar velocity, and the velocity for an infinite diameter-to-wavelength ratio is the bulk (plate) velocity.

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William J. Fry, John M. Taylor, and Bertha W. Henvis, "Design of Crystal Vibrating Systems for Projectors and Other Applications," Naval Research Laboratory, August 1945. Much of the data herein presented is based on material in this report.

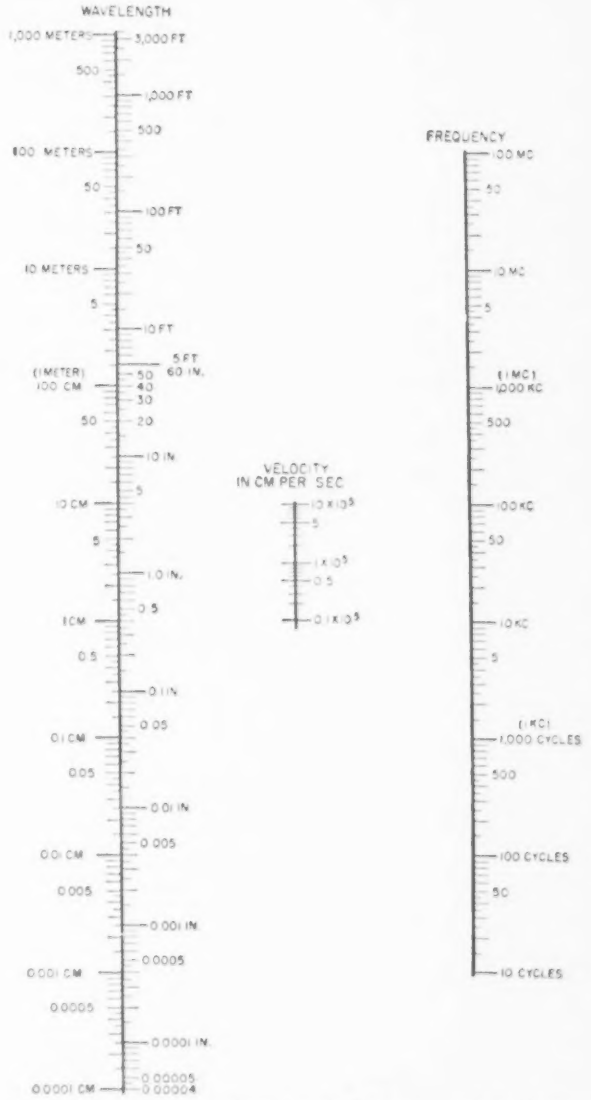


FIG. 3—Nomograph based on relation that velocity is equal to product of frequency and wavelength. When any two known values are connected by straightedge, intersection with third scale determines value sought

HIGH-PASS, LOW-PASS and BAND-PASS

Rearrangement of equations and accompanying charts permit design of multisection filters with only two or at most three settings of a reactance slide rule. Filter component values are specified as functions of midband frequency and terminating impedance

By C. J. MERCHANT

MUCH of the drudgery in designing high-pass and low-pass filters for audio frequencies may be eliminated by the simple expedient described here.

The formulas for L and C in a single constant-k high-pass T- section are $L = R/4\pi f_c$ and $C = 1/\pi f_c R$ where f_c is the cutoff frequency and R is the terminating resistance. A simple rearrangement of these expressions gives $2\pi(f_c R)L = \frac{1}{2}$ and $1.2\pi(f_c R)\cdot C = 1$, or, in other words, L is the inductance whose reactance at the frequency $f_c R$ is equal to $\frac{1}{2}$ ohm, and in a similar manner C is the capacitance whose reactance at the frequency $f_c R$ is found to be equal to 1 ohm.

The method can be extended to other types of sections, and a multisection filter can be designed with only two settings of a reactance slide rule, once at f_c/R for the inductances and once at $f_c R$ for the capacitances. In multisection filters the sharpest cutoff consistent with high attenuation outside the pass band is realized by using terminating m-derived half-sections with $m = 0.6$, a full m-derived section with $m = 0.8$, and one or more constant-k sections.

Figure 1 gives the values of the reactances in ohms in such sections, the coils being evaluated at $f_c R$ and the capacitors at $f_c R$.

For example, to design a three-section low-pass filter of T-sections with $R = 500$ ohms and $f_c = 1{,}000$ cps, find on the slide rule that $f_c \times 2 = 1{,}000 \times 500$ or 2 cps. Also on the slide rule, find the inductance whose reactance at 2 cps is the value given in Fig. 1. Then determine $f_c R$ to be $1{,}000 \times 500$ or 500 kc and find the capacitance whose reactance at 500 kc is the value given in Fig. 1. The complete filter and its attenuation characteristic are given in sections A and B of Fig. 2.

Low-pass or high-pass filters can be completely specified in terms of two quantities, the cutoff frequency and the terminating impedance. Band-pass filters introduce an additional

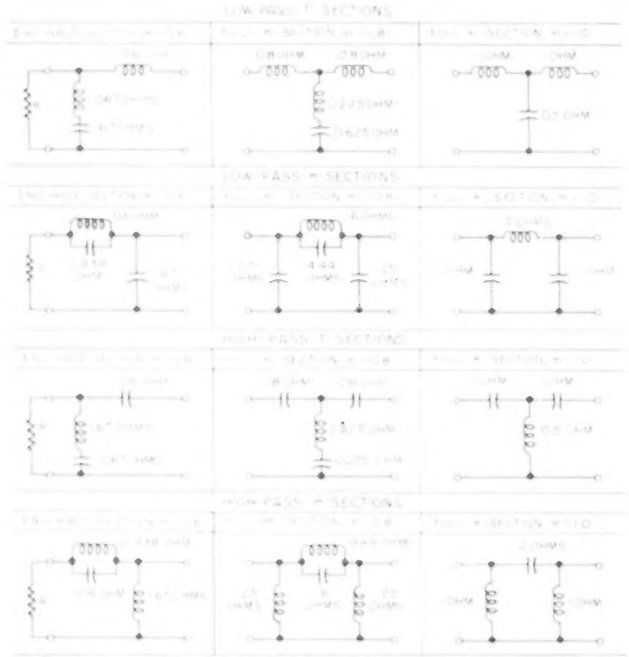


FIG. 1—Generalized impedance chart from which impedances are calculated by reactance slide rule if terminating impedance and cutoff frequency are given

FILTER DESIGN

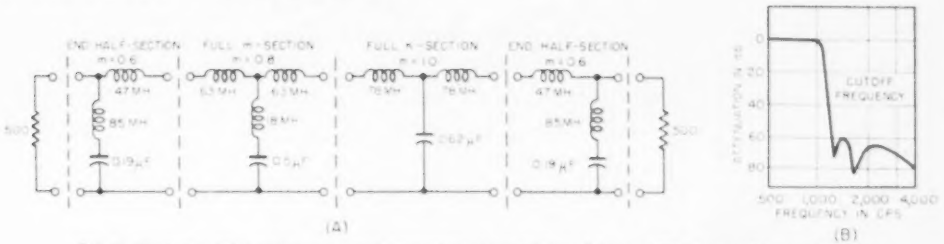


FIG. 2—Illustrative filter design values and attenuation characteristics of low pass filter designed by use of Fig. 1

quantity, the bandwidth, and therefore require three quantities to specify their performance, but their calculation can be simplified by means of the technique used for low and high-pass filters.

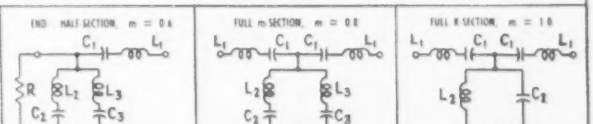
The charts in Fig. 3 give the reactance constants, in ohms, of T and π band-pass sections in terms of the terminating impedance R, the upper cutoff frequency f_u and the midband frequency f_m, which is the geometric mean of the upper and lower cutoff frequencies and is given by $f_m = \sqrt{f_u f_l}$.

For example, to design a 3-section filter of π-sections with cutoff frequencies at 770 cps and 1,300 cps and terminated in 1,000 ohms, find $f_m = \sqrt{770 \times 1{,}300} = 1{,}000$ cps first. Find $f_u / f_m = 1{,}300 / 1{,}000 = 1.30$. Then find $f_m / R = 1{,}000 / 1{,}000 = 1$ cps, and find the inductances whose reactances in ohms at 1 cps are the values given on the chart opposite $f_u / f_m = 1.30$. Then find $f_m / R = 1{,}000 / 1{,}000 = 1$ mc and find the capacitances in like manner.

When f_u / f_m is greater than 1.50, the filter can be more economically designed by cascading low and high-pass sections whose pass bands overlap.

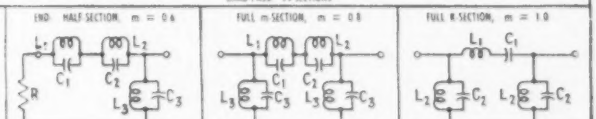
In specifying values for the actual filter design, elements appearing directly in parallel or in series after cascading should be combined.

BAND PASS T SECTIONS



f_2/f_1	END HALF SECTION, m = 0.6: X_1 at $f=f_m/R$			END HALF SECTION, m = 0.6: X_2 at $f=f_m R$			FULL m SECTION, m = 0.8: X_1 at $f=f_m/R$			FULL m SECTION, m = 0.8: X_2 at $f=f_m R$			FULL K SECTION, m = 1.0: X_1 at $f=f_m/R$		FULL K SECTION, m = 1.0: X_2 at $f=f_m R$	
	L_1	L_2	L_3	C_1	C_2	C_3	L_1	L_2	L_3	C_1	C_2	C_3	L_1	L_2	C_1	C_2
1.05	6.12	20.4	22.1	6.12	22.1	20.4	8.15	4.23	4.98	8.15	4.98	4.23	10.2	0.049	10.2	0.049
1.10	3.16	9.87	12.7	3.16	12.7	9.87	4.21	2.04	2.78	4.21	2.78	2.04	5.26	0.095	5.26	0.095
1.15	2.14	6.49	9.20	2.14	9.20	6.49	2.86	1.31	2.04	2.86	2.04	1.31	3.57	0.140	3.57	0.140
1.20	1.63	4.72	7.40	1.63	7.40	4.72	2.17	0.935	1.73	2.17	1.73	0.935	2.72	0.183	2.72	0.183
1.25	1.33	3.70	6.48	1.33	6.48	3.70	1.78	0.736	1.53	1.78	1.53	0.736	2.22	0.225	2.22	0.225
1.30	1.11	3.03	5.80	1.11	5.80	3.03	1.48	0.588	1.41	1.48	1.41	0.588	1.88	0.265	1.88	0.265
1.35	0.984	2.56	5.42	0.984	5.42	2.56	1.31	0.506	1.34	1.31	1.34	0.506	1.64	0.304	1.64	0.304
1.40	0.876	2.22	5.12	0.876	5.12	2.22	1.17	0.438	1.30	1.17	1.30	0.438	1.46	0.342	1.46	0.342
1.45	0.792	1.96	4.95	0.792	4.95	1.96	1.06	0.385	1.27	1.06	1.27	0.385	1.32	0.380	1.32	0.380
1.50	0.720	1.75	4.71	0.720	4.71	1.75	0.96	0.340	1.25	0.96	1.25	0.340	1.20	0.417	1.20	0.417

BAND PASS TT SECTIONS



f_2/f_1	END HALF SECTION, m = 0.6: X_1 at $f=f_m/R$			END HALF SECTION, m = 0.6: X_2 at $f=f_m R$			FULL m SECTION, m = 0.8: X_1 at $f=f_m/R$			FULL m SECTION, m = 0.8: X_2 at $f=f_m R$			FULL K SECTION, m = 1.0: X_1 at $f=f_m/R$		FULL K SECTION, m = 1.0: X_2 at $f=f_m R$	
	L_1	L_2	L_3	C_1	C_2	C_3	L_1	L_2	L_3	C_1	C_2	C_3	L_1	L_2	C_1	C_2
1.05	0.045	0.049	0.163	0.049	0.045	0.163	0.236	0.201	0.123	0.201	0.236	0.123	20.4	0.098	20.4	0.098
1.10	0.079	0.101	0.316	0.101	0.079	0.316	0.490	0.360	0.238	0.360	0.490	0.238	10.5	0.190	10.5	0.190
1.15	0.109	0.154	0.467	0.154	0.109	0.467	0.763	0.490	0.350	0.490	0.763	0.350	7.14	0.280	7.14	0.280
1.20	0.135	0.212	0.613	0.212	0.135	0.613	1.07	0.578	0.461	0.578	1.07	0.461	5.44	0.367	5.44	0.367
1.25	0.154	0.270	0.750	0.270	0.154	0.750	1.36	0.653	0.562	0.653	1.36	0.562	4.44	0.450	4.44	0.450
1.30	0.172	0.330	0.900	0.330	0.172	0.900	1.78	0.709	0.675	0.709	1.70	0.675	3.76	0.531	3.76	0.531
1.35	0.184	0.391	1.02	0.391	0.184	1.02	1.98	0.746	0.763	0.746	1.98	0.763	3.28	0.609	3.28	0.609
1.40	0.195	0.458	1.14	0.458	0.195	1.14	2.28	0.769	0.855	0.769	2.28	0.855	2.92	0.685	2.92	0.685
1.45	0.202	0.510	1.26	0.510	0.202	1.26	2.60	0.787	0.943	0.787	2.60	0.943	2.64	0.760	2.64	0.760
1.50	0.212	0.572	1.39	0.572	0.212	1.39	2.94	0.800	1.04	0.800	2.94	1.04	2.40	0.834	2.40	0.834

FIG. 3—Generalized impedance tables from which filter impedances are quickly calculated if the upper cutoff frequency, midband frequency and terminating impedance of a band-pass filter are all known. These dimensionless impedance tables are obtained by specifying filter component values as functions of midband frequency and terminating impedance for various values of the ratio of upper to midband frequency

DESIGN OF T PADS

Graphs for determining resistance of the three elements of dissymmetrical T-pad networks facilitate design of pads having attenuation of as much as 25 db, and impedance mismatch ratios up to 5 to 1. Graphs apply to symmetrical pads with matched loads

By EDWIN Y. WEBB, Jr.

IN radio and communications work the necessity for pads or attenuators of definite electrical loss and definite terminal impedance often arises. It is the purpose here to facilitate the design and construction of such pads of symmetrical or dissymmetrical T configuration, through simple, rapid, graphical methods, without making necessary recourse to the usual mathematical design equations.

In the following discussion a and b will refer to the series impedances and c the shunt impedance of the three-element T network. As pads with elements other than pure resistances are seldom encountered, only the case of a pure resistance network will be discussed, although the symbol Z will be used. If a balanced pad is desired, it is necessary merely to place half of the value of a and half of the value of b in the two lower branches of the pad.

Three individual graphs are given in Fig. 1, one for each of the impedance elements in a T network. Each graph contains a family of curves, one for each of several different values of attenuation or loss in decibels. The family of curves is plotted to show the normalized resistance (for the element a, b or c of the T for which the curve applies) as ordinates, against the ratio of impedance transformation as abscissa. Since the curves are plotted for the normalized impedance of 1 ohm, the resistances found from the curves must be multiplied by the actual impedance value of the input circuit to obtain the true values of resistance for the elements of the desired T network. By plotting normalized impedances, only one set of curves is required no matter what the impedance value may be. It should be noted that while the curves are plotted for a dissymmetrical T network, which is useful in matching unequal impedances, the curves are equally useful for the symmetrical T network for matching equal impedances since in the latter case the impedance transformation is 1-1, and a and b are equal.

The graphs can be used for any impedance ratio normally encountered in practice. If an impedance ratio less than 1 is encountered, the T network can be reversed, for purposes of analysis, to obtain a transformation ratio greater than 1. The curves can of course be used for uneven ratios, such as 2.5-1 or 3.7-1. The curves can likewise be used for symmetrical T pads, for in this case the terminal impedances Z_1 and Z_2 will be alike. The network impedances a and b will also be alike, and hence we need only use the curves for determining two separate constants a and c. The curves are plotted more accurately than the accuracy of commercial resistors, and consequently errors involved from the graphical design method will be negligible for ordinary purposes. Care should be exercised in reading the curves, however, to ascertain that the scales are not misinterpreted.

Note that the actual values of Z_1 and Z_2 (the terminal impedances) do not affect in any way whatever the values used in plotting the curves as only their ratios were used. Therefore, for a 10-db pad with terminal impedances of 5 and 10 ohms the identical points on the curves will be used as if the terminal impedances were 300 and 600 ohms, as in both cases the ratio of Z_1 to Z_2 is 2 to 1.

The loss of the pad is obtained by calculating the ratio of the power transferred from Z_1 to Z_2 with the pad in the circuit and again with the pad removed from the circuit. Assuming 1 volt applied, and impedances of 100 and 200 ohms, the power transferred when the pad is out of the circuit is

$$P_1 = PR = \left(\frac{1}{300}\right)^2 \times 200$$

With the pad in the circuit, the power absorbed by Z_2 is

$$P_2 = PR = \left[\left(\frac{1}{200}\right)\left(200 + \frac{99.2}{145 + 99.2}\right)\right]^2 \times 200 = \left[\left(\frac{1}{200}\right)\left(\frac{99.2}{144.2}\right)\right]^2 \times 200$$

The loss in decibels is then

$$db = 10 \log_{10} \frac{P_2}{P_1} = 10 \log_{10} \frac{\left(\frac{1}{300}\right)^2 \times 200}{\left[\left(\frac{1}{200}\right)\left(\frac{99.2}{144.2}\right)\right]^2 \times 200} = 10 \log_{10} \left[\left(\frac{300}{200}\right)\left(\frac{144.2}{99.2}\right)\right]^2 = 9.5 \text{ db.}$$

Hence, the terminal impedances as calculated from the graphs are correct. The loss of the network is actually 9.5 db instead of the 10 db for which it is designed, but the error is sufficiently small to be neglected for nearly all practical purposes.

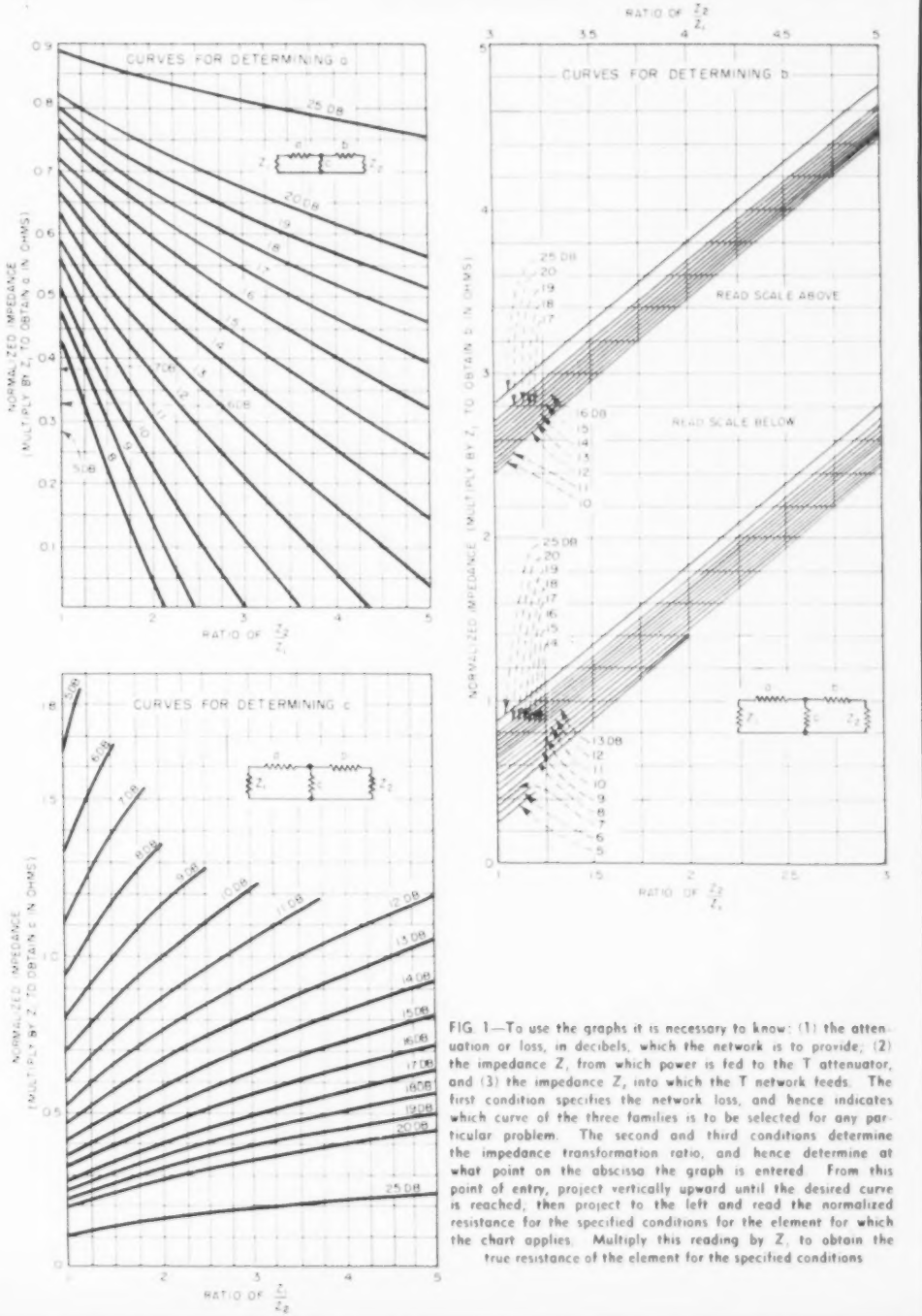
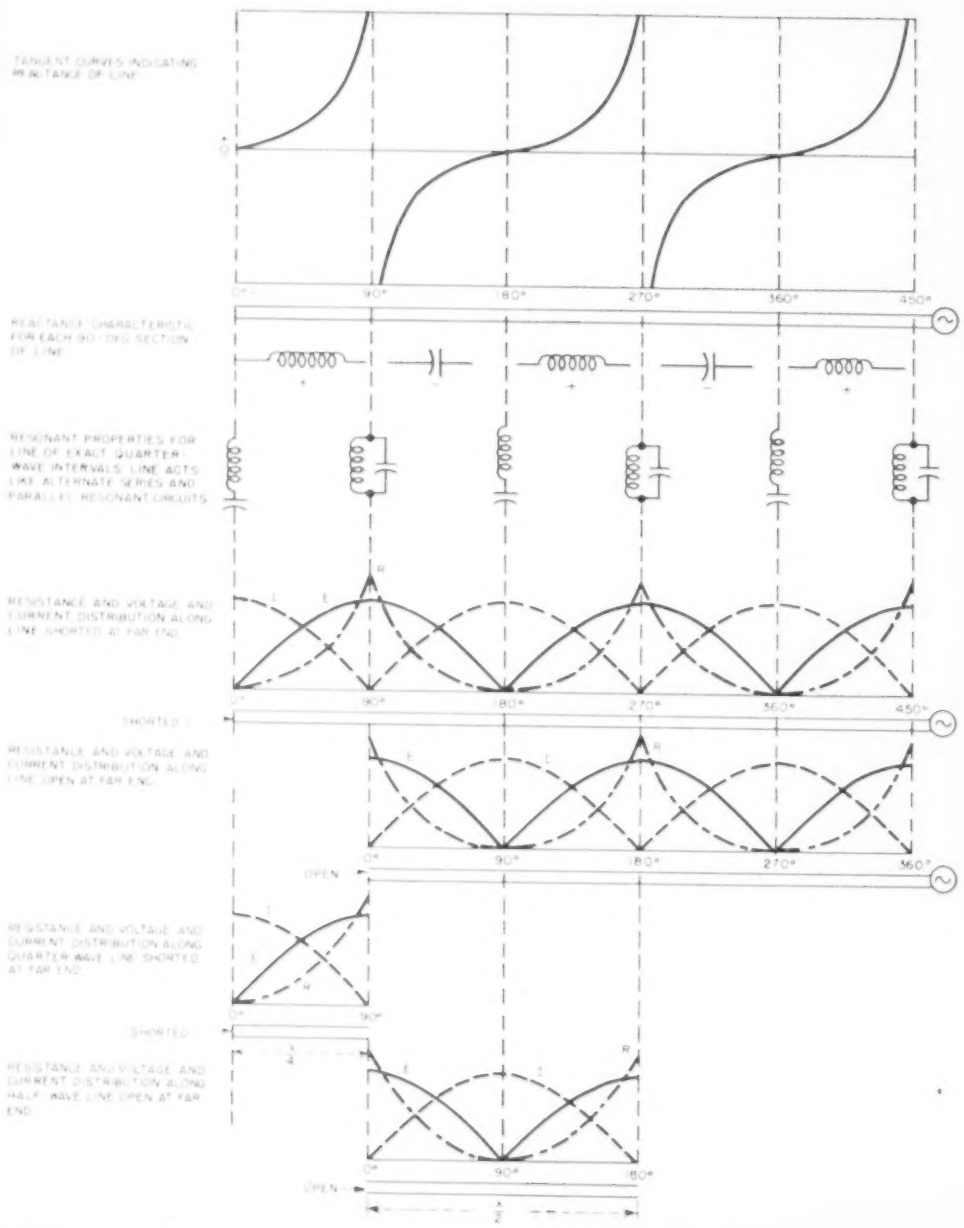

CURVES FOR DETERMINING a
NORMALIZED IMPEDANCE (MULTIPLY BY Z_1 TO OBTAIN a IN OHMS)
RATIO OF $\frac{Z_2}{Z_1}$
CURVES FOR DETERMINING b
NORMALIZED IMPEDANCE (MULTIPLY BY Z_1 TO OBTAIN b IN OHMS)
RATIO OF $\frac{Z_2}{Z_1}$
READ SCALE ABOVE
READ SCALE BELOW
CURVES FOR DETERMINING c
NORMALIZED IMPEDANCE (MULTIPLY BY Z_2 TO OBTAIN c IN OHMS)
RATIO OF $\frac{Z_1}{Z_2}$

FIG. 1—To use the graphs it is necessary to know: (1) the attenuation or loss, in decibels, which the network is to provide; (2) the impedance Z_1 from which power is fed to the T attenuator, and (3) the impedance Z_2 into which the T network feeds. The first condition specifies the network loss, and hence indicates which curve of the three families is to be selected for any particular problem. The second and third conditions determine the impedance transformation ratio, and hence determine at what point on the abscissa the graph is entered. From this point of entry, project vertically upward until the desired curve is reached, then project to the left and read the normalized resistance for the specified conditions for the element for which the chart applies. Multiply this reading by Z_1 to obtain the true resistance of the element for the specified conditions

CHARACTERISTICS OF RESONANT


TANGENT CURVES INDICATING IMPEDANCE OF LINE
0°
90°
180°
270°
360°
450°
REACTANCE CHARACTERISTIC FOR EACH 90° DEG SECTION OF LINE
RESONANT PROPERTIES FOR LINE OF EXACT QUARTER-WAVE INTERVALS. LINE ACTS LIKE ALTERNATE SERIES AND PARALLEL RESONANT CIRCUITS
RESISTANCE AND VOLTAGE AND CURRENT DISTRIBUTION ALONG LINE SHORTED AT FAR END
SHORTED
RESISTANCE AND VOLTAGE AND CURRENT DISTRIBUTION ALONG LINE OPEN AT FAR END
OPEN
RESISTANCE AND VOLTAGE AND CURRENT DISTRIBUTION ALONG QUARTER-WAVE LINE SHORTED AT FAR END
SHORTED
RESISTANCE AND VOLTAGE AND CURRENT DISTRIBUTION ALONG HALF-WAVE LINE OPEN AT FAR END
OPEN

TRANSMISSION LINES

Voltage, current and resistance along ideal or low-loss resonant lines are conveniently portrayed, together with equivalent resonant circuit at quarter-wave sections and reactance for other lengths of open or shorted lines

By J. B. EPPERSON

THE important part which transmission lines play in modern radio communication makes it useful to have available in compact form for ready reference a graphical interpretation of the behavior of such lines. For simplicity of presentation, the curves and diagrams have been plotted on the assumption that the lines are free from losses. The presence of a slight amount of attenuation will not appreciably affect the general shape of the curves, and hence the diagrams are useful for many practical applications as well as for the ideal loss-free case. If the line has appreciable attenuation, however, the curves given here must be modified slightly to apply to actual conditions.

In drawing the curves, the line is assumed to be fed from a generator whose output impedance is equal to the characteristic impedance of the line. With this stipulation, the wave is absorbed and dissipated and is not reflected from the sending end. The curves are drawn for lines whose distant ends are open or shorted, corresponding to infinite and zero resistance termination at the far end.

All of the data for which the chart has been compiled are available at a glance. For example, the length of line required to produce a high impedance, a low impedance, an inductive reactance or a capacitive reactance are directly evident.

Reading from top to bottom, the chart shows the following data for transmission lines:

The reactance curves for lines of any length. While the curves shown apply for lines whose length is one wavelength or less, the curves are periodically repetitive, and hence may be extended to lines of any length. For lines longer than one wavelength, it is convenient to determine the line characteristics by subtracting an integral number of wavelengths from the line. The remaining length of line will then be less than one wave in length, and its characteristics may then be determined from the graphs.

The electrical equivalent reactance for lines of various lengths between exact multiples of a quarterwave line. When the reactance curve is positive, the electrical equivalent reactance is inductive, whereas it is capacitive for lines of such length that the reactance curve is negative. The ideal line, free from attenuation, behaves either as a pure inductive reactance or as a pure capacitive reactance within any given quarterwave section. Actual lines, in which some attenuation is present, will also show a resistive component as well as the reactive component, but this is not indicated on the diagram.

The resonant circuit characteristics of the line at exactly each quarter wavelength. The ideal line behaves as a series resonant circuit and as a parallel resonant circuit alternately every quarter of a wave long. In the ideal case the line has zero resistance when the series resonant circuit is used to represent it, and has infinite impedance for those quarter-wavelengths for which it behaves as a parallel resonant circuit. Actually, real physical lines have more than zero and less than infinite resistance at these points. The line is resonant at 90-degree intervals for both open and shorted cases, and for quarter-wave intervals the line behaves alternately as a series and as a parallel resonant circuit.

The resistance and the voltage and current distribution for open and shorted lines. For convenience the resistance curve is plotted along with the voltage and current distribution along the length.

For the shorted line, the graphs show that, as measured from the shorted end, the line acts first as an inductance for the first quarter-wave section, then as a capacitance for the next quarter-wave section, and so on, alternately for each 90-degree interval.

For the open-end line, the graph shows that, as measured from the open end, the line acts first as a capacitance and then as an inductance, alternately, for each quarter-wave section.

The quarter-wave diagram near the bottom of the charts show that a quarter-wave section of line may be considered as a tuned circuit. If the line is slightly less than a quarter-wave, it will present inductive reactance, whereas if it is slightly longer than a quarter-wave, the section will assume the characteristics of a capacitance.

In a similar manner, the lowest diagram shows that a half-wave line may be considered as a tuned circuit element. If the line is slightly less than a half-wave long, its reactance will be inductive, whereas the reactance will be capacitive if the line is slightly longer than a half-wave.

TEN R-F TRANSMISSION LINE

Ten equations commonly used to compute relationships between electrical and mechanical properties of radio-frequency transmission lines have been converted to convenient nomographs covering both two-wire and coaxial lines for frequencies up to 20,000 mc

By PHILLIP H. SMITH

TEN of the most useful transmission-line equations have been plotted as nomographs as a convenience to the radio engineer. The derivation of the formulas is based upon certain simplifying assumptions which are generally considered justifiable for r-f lines.

1. *Characteristic Impedance of Transmission Lines.* For radio-frequency transmission lines where the losses per wavelength are relatively small, the characteristic impedance is essentially a pure resistance. The characteristic impedance is numerically equal to the square root of the ratio of the distributed inductance to the distributed capacitance per unit length. Since both of these parameters are uniquely related to the physical size and spacing of the conductors, it is possible to express the characteristic impedance in terms of the physical dimensions of the line.

Thus, the characteristic impedance Z_o in ohms of an open 2-wire line is

$$Z_o = 276 \log_{10} (2D/d) \qquad (1)$$

where D is the wire separation on centers and d is the wire diameter, both in the same units. Figure 1 shows the characteristic impedance of an open 2-wire line as a function of the conductor dimensions and their center-line spacing.

2. *Characteristic Impedance of a Coaxial Line.* The characteristic impedance Z_o in ohms of a coaxial transmission line is

$$Z_o = 138 \log_{10} (D/d) \qquad (2)$$

where D is the inner diameter of the outer conductor and d is the outer diameter of the inner conductor. This applies only to a line where the medium between conductors is predominantly a gas, such as air, at low pressures.

If the coax line is filled with a uniform dielectric material other than a low-pressure gas, the characteristic impedance is reduced by a factor equal to $1/k^{\frac{1}{2}}$, where k is the relative dielectric constant of the material. For a line with bead insulators at small uniform intervals, the effective dielectric constant k_e may be computed from

$$k_e = (kt + s)/(t + s) \qquad (2a)$$

where t is the thickness of one bead and s is the spacing between two beads, both t and s being in the same units, and k is the relative dielectric constant of the bead.

A number of optimum values for the characteristic impedance of coaxial lines exist which are based upon different considerations such as the maximum power handling capability and

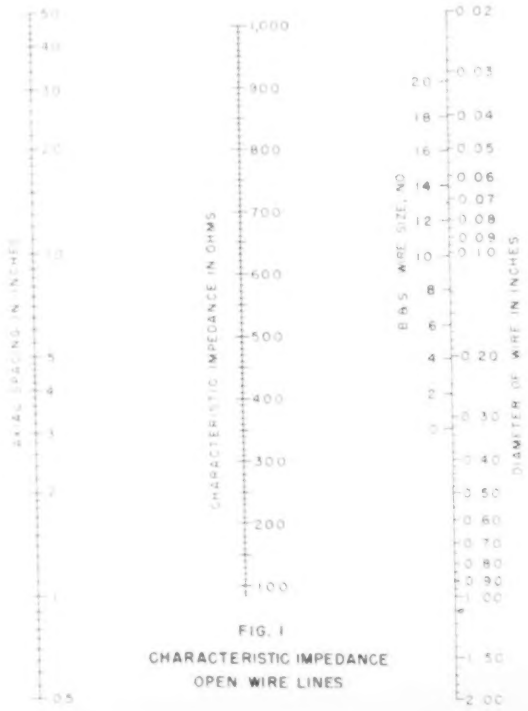


FIG. 1
CHARACTERISTIC IMPEDANCE
OPEN WIRE LINES

the minimum loss. Several of these optimum values are indicated along the characteristic impedance scale on the right-hand side of the nomograph. Fortunately, all of these optimums are relatively broad in their characteristics and a considerable departure can generally be tolerated for any particular application.

Figure 2 shows the characteristic impedance of a gas dielectric coaxial transmission line as a function of the two conductor diameters.

3. High-Frequency Resistance of a Coaxial Line. The high-frequency resistance of a coaxial transmission line is one of the principal factors which determine the attenuation along the line. It is also one of the factors which determine the maximum anti-resonant impedance and the minimum resonant impedance of a line section when used as a circuit element. The high-frequency resistance of a coaxial line is a function of both conductor dimensions and of the frequency (due to skin effect). It is also a function of the resistivity of the material of which the conductors are made.

For copper coaxial lines the high-frequency loop resistance R in ohms per 1,000 feet is

$$R = 0.0315 f^{0.5} \left[\frac{1}{d} + \frac{1}{D} \right] \qquad (3)$$

where f is the frequency in kilocycles, D is the inner diameter of the outer conductor in inches, and d is the outer diameter of the inner conductor in inches.

For conductors other than copper, the high-frequency resistance is proportional to the square root of the ratio of the resistivity of the conductor to that of copper.

Figure 3 shows the resistance of a copper coaxial line as a function of the conductor dimensions and the frequency. Dielectric losses, which are negligible in a gas dielectric line, are not included.

The nomograph in Fig. 3 is used as follows: draw a straight line connecting points on the first and fourth scales from the left, which show, respectively, the line conductor diameters. Obtain the intersection of this line with the second scale, marked Size Factor. Now project this intersection to a corresponding point on the third scale, marked Pivot Line, as shown in the example on the nomograph. Finally, connect this new pivot point with a straight line intersecting the desired value on the sixth or frequency scale. The intersection of this latter straight line with the scale marked Resistance in ohms per 1,000 feet gives the desired loop resistance value.

4. Conversion of Loss Resistance to Decibels Attenuation per Unit Length. It is sometimes convenient to convert loop resistance of a transmission line (as obtained from Fig. 3) to decibels (db) per unit length. This may be done if the characteristic impedance of the line is known. The conversion equation is simply

$$\text{db} = R / 0.23025 Z_0 \qquad (4)$$

where R is the loop resistance and Z_0 is the characteristic impedance. This relationship is plotted on the nomograph of Fig. 4. The nomograph applies to either open-wire or coaxial lines and does not require the line conductors to be of copper.

5. Antiresonant Impedance of a Transmission Line Section. The antiresonant impedance Z_{ar} of a transmission line section either open or short-circuited at its far end is a function of the

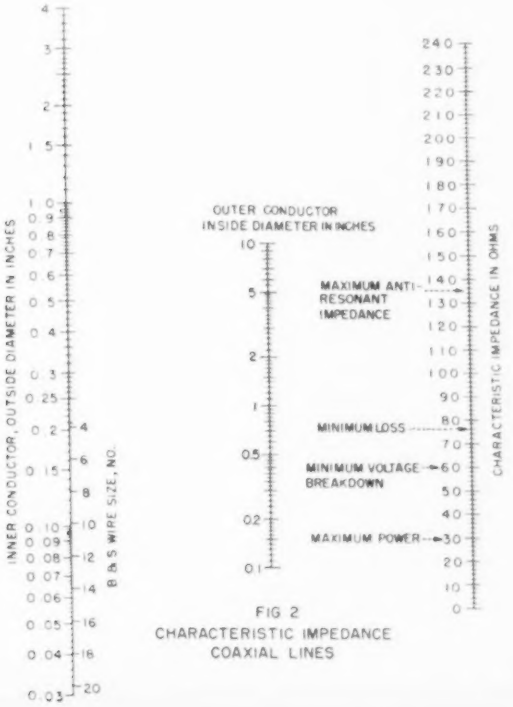

INNER CONDUCTOR, OUTSIDE DIAMETER IN INCHES
B & S WIRE SIZE, NO.
OUTER CONDUCTOR INSIDE DIAMETER IN INCHES
MAXIMUM ANTI-RESONANT IMPEDANCE
MINIMUM LOSS
MINIMUM VOLTAGE BREAKDOWN
MAXIMUM POWER
CHARACTERISTIC IMPEDANCE IN OHMS

FIG 2
CHARACTERISTIC IMPEDANCE
COAXIAL LINES

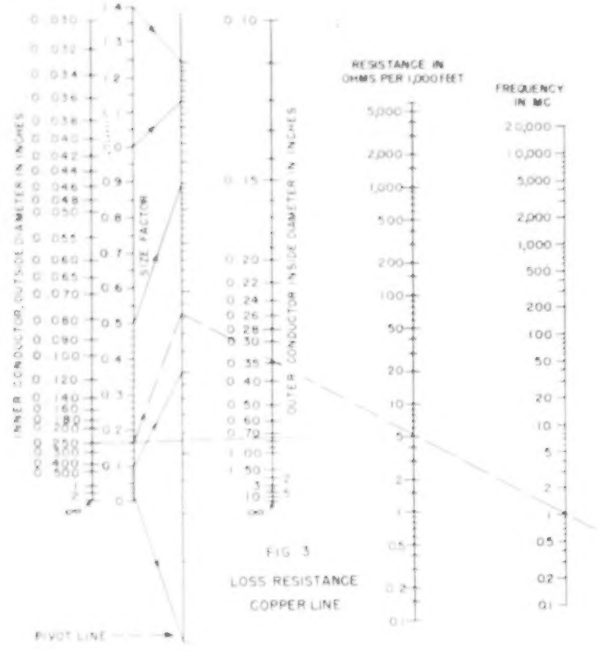

INNER CONDUCTOR, OUTSIDE DIAMETER IN INCHES
SIZE FACTOR
OUTER CONDUCTOR INSIDE DIAMETER IN INCHES
RESISTANCE IN OHMS PER 1,000 FEET
FREQUENCY IN MC
PIVOT LINE

FIG 3
LOSS RESISTANCE
COPPER LINE

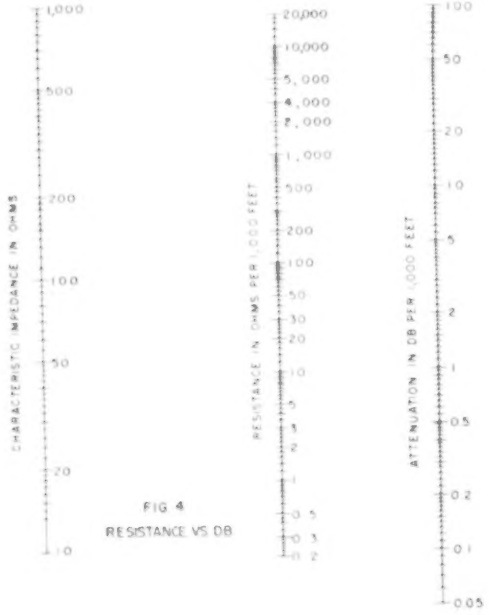


FIG 4
RESISTANCE VS DB

total conductor resistance and the characteristic impedance of the section. The relationship is

$$Z_{AR} = 2Z_0^2/R \qquad (5)$$

where Z_0 is the characteristic impedance and R is the resistance of the antiresonant line section.

The shortest antiresonant line section is one-quarter wavelength long (short-circuited at its far end) and accordingly this will have the highest antiresonant impedance. A line section one-half wavelength long (open-circuited at the far end) will have only half as high an antiresonant impedance because its resistance R is twice as great.

Figure 5 shows the antiresonant impedance of a transmission line as a function of the total resistance and the characteristic impedance of the section. The nomograph applies equally to either coaxial or open-wire lines.

The resonant impedance of a transmission-line section is simply one-half of its total resistance (obtained from Fig. 3); accordingly, no nomograph has been plotted for this.

6. Input Reactance of a Transmission-Line Section. A short length of transmission line is sometimes used as a reactance element in high-frequency circuits. The input reactance is a function of the electrical length of the line section and its characteristic impedance. The reactance varies between values essentially equivalent to plus and minus one half of the antiresonant impedance (obtained from Fig. 5). In air or gas dielectric coaxial lines, the electrical length is very nearly the same as the physical length measured in terms of free space wavelengths. A dielectric other than a gas results in a reduction in the length of the wave in the line which is proportional to the square root of the average dielectric constant. Thus a polyethylene coaxial cable with a dielectric constant of 2.5 will be electrically $(2.5)^{\frac{1}{2}}$ or 1.6 times as long as if the dielectric were a gas.

The electrical length and the characteristic impedance of a line section as well as its termination (either open circuit or short circuit) determine the magnitude and sign of the input reactance. For an open-wire or coaxial line section, open-circuited at its far end, the input reactance X_i in ohms is

$$X_i = -Z_0 \cot (360\, l/\lambda) \qquad (6)$$

where l/λ is the electrical length in wavelengths and Z_0 is the characteristic impedance.

For an open-wire or coaxial line section, short circuited at its far end, the input reactance X_i in ohms is

$$X_i = Z_0 \tan (360\, l/\lambda) \qquad (6a)$$

Figure 6 shows the input reactance of an open or short-circuited transmission-line section as a function of the electrical length, the characteristic impedance and the termination.

7. Quarter-Wave Transmission-Line Impedance Transformers. Impedance transformers are often made along radio-frequency transmission lines by employing a quarter-wave section of transmission line of selected characteristic impedance as an impedance transformer. When such a line section is terminated in a pure resistance its input impedance will be a pure resistance which depends upon the load resistance value and the value of the characteristic impedance of the quarter-wave line section.

Figure 7 shows the input resistance R_i in ohms of a quarter-wave open-wire or coaxial line section terminated in a pure resistance load. The relationship is

$$R_i = Z_0^2/R_l \qquad (7)$$

where R_l is the terminating resistance and Z_0 is the characteristic impedance.

8. Current-Phase Relationship Along a Transmission Line. The phase relationship of the current from point to point along a radio - frequency transmission line will be uniform with length only when the line is terminated in an impedance equivalent to its characteristic impedance.

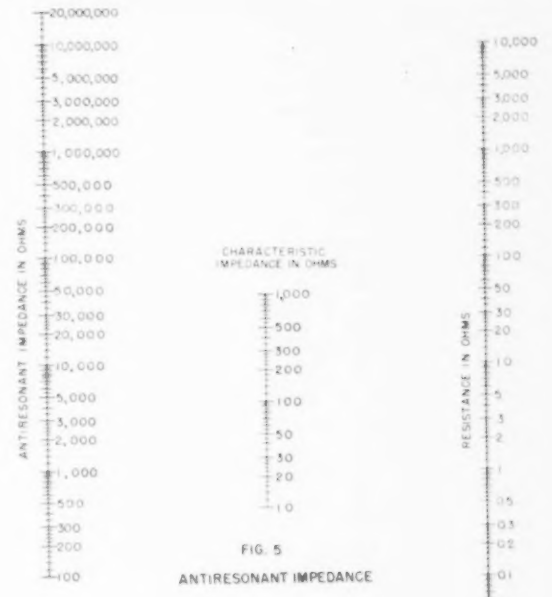


FIG. 5

ANTIRESONANT IMPEDANCE

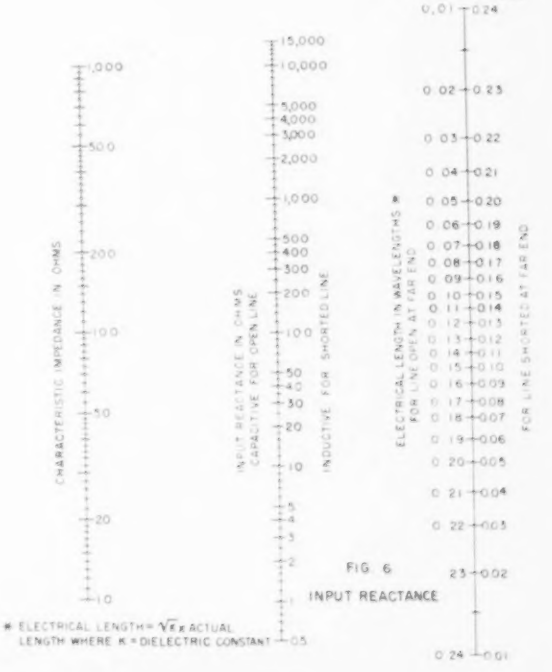


FIG. 6

INPUT REACTANCE

* ELECTRICAL LENGTH = $\sqrt{K} \times$ ACTUAL LENGTH WHERE K = DIELECTRIC CONSTANT

otherwise the phase will vary nonuniformly along the line.

Figure 8 shows the phase relationship of the current at the sending end of a line, with respect to the current in a resistance load, as a function of the ratio of the load resistance to the characteristic impedance of the line, and of the effective length of line. The relationship giving line length in degrees is

$$\phi = \arctan\left[\frac{R_L}{Z_o}\tan\left(360\,\frac{l}{\lambda}\right)\right] \quad (8)$$

where R_L is the load resistance, Z_o is the characteristic impedance and l/λ is the electrical length in wavelengths.

The current in the load will always lag the current at the sending end of a transmission line. It will undergo exactly 180 degrees of phase shift in each electrical halfwave length regardless of the ratio of the load resistance to the characteristic impedance.

9. Voltage Gradient along a Coaxial Line. In a coaxial transmission line the maximum voltage gradient occurs at the surface of the inner conductor. When this gradient exceeds the critical value of approximately 20,000 volts (rms) per cm, breakdown will occur in the form of either corona or arcover. If the characteristic impedance of the line is less than the optimum breakdown value of 60 ohms, arcover will occur without corona; if it is more than 60 ohms, corona will precede arcover.

Figure 9 shows the maximum voltage gradient G_{max} in rms volts per cm on a coaxial line as a function of the characteristic impedance of the line, the physical size of the inner conductor and the applied voltage. The relationship is

$$G_{max} = 47.2E/dZ_o \quad (9)$$

where E is the applied rms voltage, d is the diameter of the inner conductor in inches, and Z_o is the characteristic impedance.

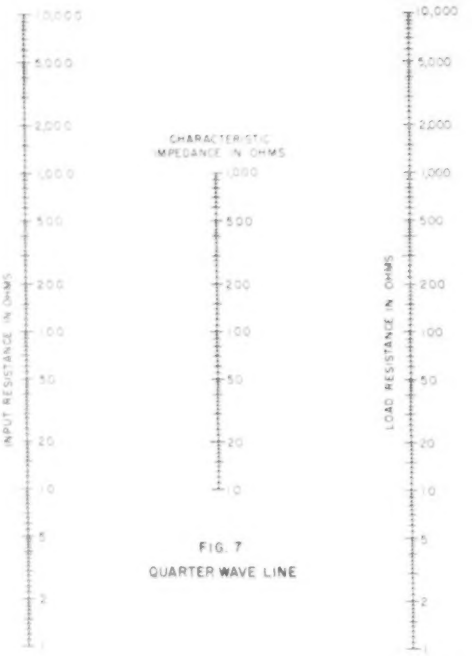


FIG. 7
QUARTER WAVE LINE

FIG. 8
PHASE RELATIONS

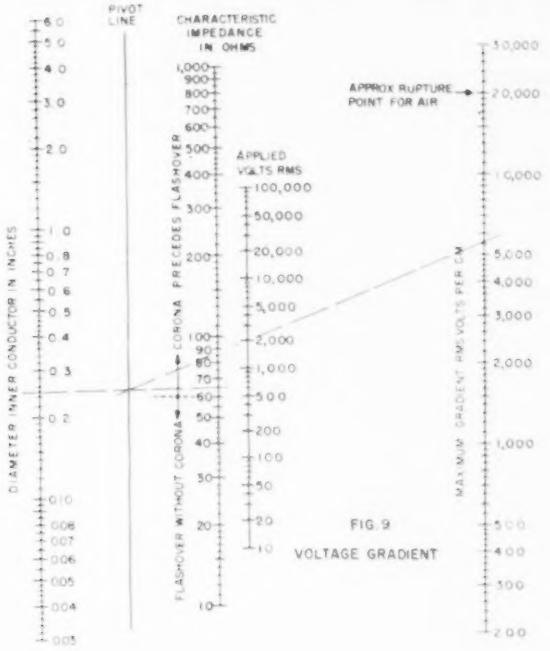


FIG. 9
VOLTAGE GRADIENT

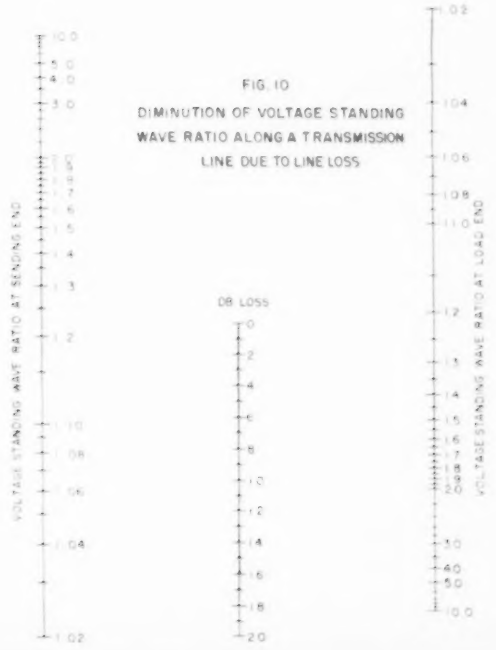


FIG. 10
DIMINUTION OF VOLTAGE STANDING WAVE RATIO ALONG A TRANSMISSION LINE DUE TO LINE LOSS

This nomograph, Fig. 9, is used as follows: first, connect with a straight line points on the first and third scales from the left which represent the inner conductor diameter and the characteristic impedance (see example on nomograph). The intersection of this line with the second scale, labeled Pivot Line, is next connected with a second straight line passing through the desired point on the fourth scale, labeled Applied Volts RMS. The intersection of this second straight line with the fifth scale gives the desired value for the gradient on the surface of the inner conductor in rms volts per cm.

Bead insulators may cause higher gradients in their vicinity, resulting in premature voltage breakdown, particularly if they fit loosely on the inner conductor.

10. Diminution of Standing-Wave Ratio Due to Line Loss. A high-frequency transmission line whose characteristic impedance is not matched by the load impedance will have standing waves along its length. The standing-wave ratio in the vicinity of the load will be numerically equal to the ratio of the load resistance to the characteristic impedance (or its reciprocal if this is less than unity). If the line has attenuation, there will be a gradual diminution of the standing-wave ratio in the direction of the generator.

Figure 10 shows the relationship between the standing-wave ratio in a region near the generator (assuming that the wavelength is small compared to the line length), the standing-wave ratio near the load, and the line loss in decibels (as obtained from Fig. 3 and 4). The relationship is

$$\text{db} = \left[10 \log_{10} \frac{(S_L + 1)(S_G - 1)}{(S_L - 1)(S_G + 1)} \right]^{1/2} \quad (10)$$

where S_L is the voltage-standing-wave ratio near the load and S_G is the voltage standing wave ratio near the generator.

SQUARE-WAVE RESPONSE

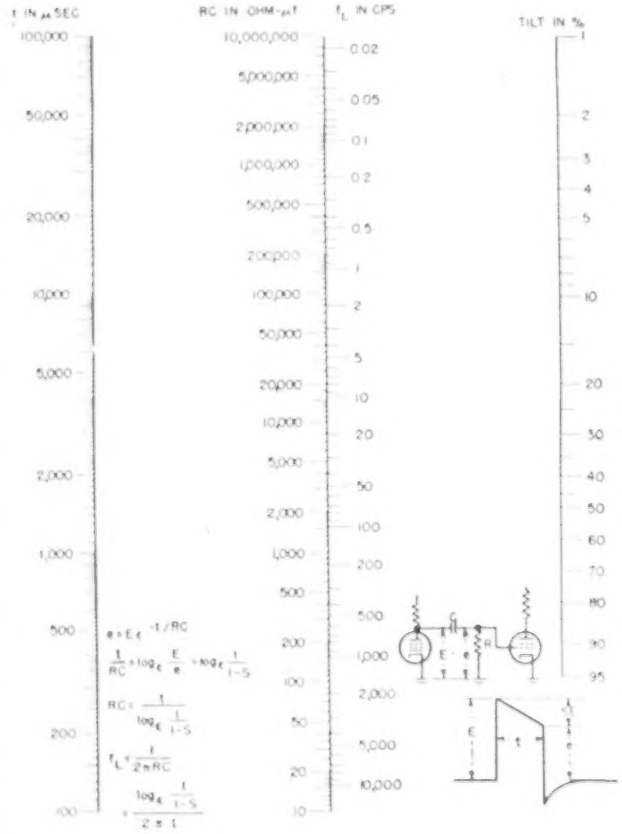
Nomograph correlates tilt of square wave after passage through an uncompensated R-C-coupled video or audio amplifier with low-frequency response of amplifier and time constant of coupling circuit

By A. J. BARACKET

WHEN USING rectangular or square waves for testing audio and video amplifiers, the output of the amplifier is compared with the input on an oscilloscope. The degree or percent of tilt of the top of the square wave represents the deterioration of the lower frequencies in the amplifier.

In the uncompensated R-C-coupled amplifier stage shown, the effect of the amplifier on low frequencies is almost completely a function of the value of the R-C time constant in the grid-coupling circuit. The smaller the time constant, the poorer the low-frequency response and consequently the greater the percent tilt S of a rectangular wave (referred to the peak plate voltage value E, as indicated on the waveform diagram).

The accompanying nomograph is useful in computing the R-C value required to give a maximum specified tilt S (expressed as a decimal part of E) for a rectangular wave having a duration t, or conversely it may be used to determine the tilt that will be obtained from a given time constant. The chart also gives the relationship between tilt and low-frequency cutoff of an amplifier coupling circuit (the frequency f_L at which the amplitude-frequency response characteristic is down 3 db).



Example of Use

The percent tilt of an uncompensated video amplifier stage is specified as 2 percent maximum on a 60-cycle square wave. What will be the required time constant of the coupling circuit and the corresponding low cutoff frequency?

By means of a straightedge, connect the 2-percent point on the tilt scale with the 8,300-μsec point (corresponding to the half-cycle duration of a 60-cycle square wave) on the t scale. The straightedge will cross the R-C scale at approximately 410,000 ohm-μf. The corresponding low cutoff frequency f_L is found to be 0.4 cycle.

MIXER FREQUENCY CHARTS

CHART I. OUTPUT FREQUENCY = B − A

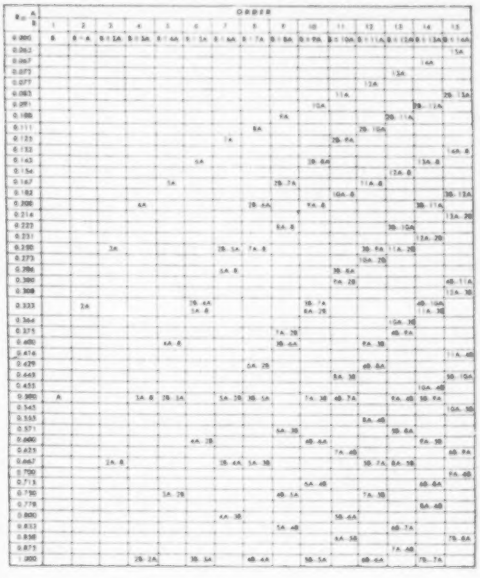


CHART I. Output Frequency = $B - A$

PROCEDURE: Divide smaller mixer input frequency by larger to get R. If this value of R is on the chart applying to the case, coincidence exists and components causing it are given somewhere to the right, with their order given at top of chart. If coincidence does not exist, calculate low order component frequencies for nearest ratios to determine selectivity requirements.

CHART II. OUTPUT FREQUENCY = B + A

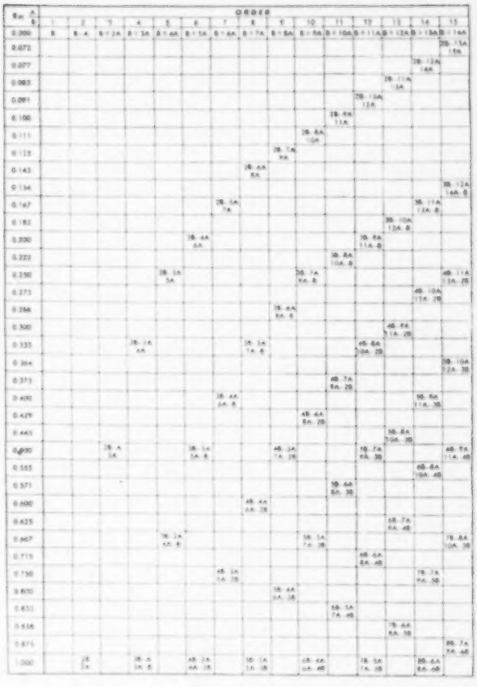


CHART II. Output Frequency = $B + A$

By R. S. BADESSA

WHEN two frequencies, B and A, are mixed to produce the sum frequency $B + A$ or the difference frequency $B - A$, a possibility exists that some harmonic of B, or some harmonic of A, or some combination of the harmonics of B and A will produce unwanted components lying close to the desired frequency. When the ratio of the two input frequencies, A B, is also equal to the ratio k/l where k and l are integers and A is the smaller of the two input frequencies, two unwanted components exist capable of coinciding or zero beating with the sum frequency $B + A$. These are $(l + 1)A - (k - 1)B$ and $(k + 1)B - (l - 1)A$. Where the wanted frequency is $B - A$, the corresponding unwanted components are $(l - 1)A - (k - 1)B$ and $(k + 1)B - (l + 1)A$.

If coincidence does not exist, notice the components corresponding to ratios not far removed from the ratio being investigated. The frequencies of these components, especially those of low order, should be calculated to determine how difficult a selectivity problem exists.

Example. A frequency of 4.9 mc is mixed with a frequency of 2.1 mc to produce a sum frequency of 7.0 mc. For this case $R = 2.1/4.9 = 0.429$. On Chart II the interfering components for $R = 0.429$ are of the tenth order and have the forms $4B - 6A$ and $8A - 2B$. Since a tenth-order component is probably not very serious, coincidence can be neglected. Other ratios in the vicinity of 0.429 are investigated next. For the ratio 0.500, there are two third-order components, of the form $2B - A$ and $3A$. These are 7.7 and 6.3 mc respectively and may or may not cause trouble, depending on the selectivity of the 7-mc channel.

FILTER RIPPLE CHART

Where choke input is used, output characteristics are readily predetermined. Curves are given for 50 and 60-cycle, half-wave and full-wave, and single-and three-phase rectifiers. A rectifier attenuation table is included

By C. K. HOOPER

WHEN USING choke-input filters, the output ripple of rectifier-type power supplies can be predetermined from the accompanying chart.

It is necessary to know the inductance value in henrys and the capacitance in microfarads for each filter section. Knowing the product of these two terms, the amount of attenuation in db for each filter section can be read directly on the chart. Curves are given for 50-cycle (dashed lines) and 60-cycle (solid lines) power, for the four types of supplies most often used in industrial equipment.

To obtain the total output ripple in db below the d-c level, the equivalent rectifier attenuation must be added to that of the filter sections.

Practical Example

The following example will illustrate the use of the chart. Assume that a single-phase full-wave rectifier operating from a 60-cycle supply has a two-stage choke-input filter. One of the filters consists of a 2-henry choke and 15-μf capacitor. The other filter consists of a 2-henry choke and 20-μf capacitor.

For the first filter, with an LC product of $2 \times 15 = 30$, the attenuation is read as 24.5 db. The second filter has an LC product of $2 \times 20 = 40$ and the attenuation is read as 27 db. From the table the equivalent rectifier attenuation of a single-phase full-wave rectifier is given as + 6.5 db.

The total resulting ripple attenuation is the sum of that of the individual filter sections plus that of the rectifier. In this case, the total is $24.5 + 27 + 6.5 = 58$ db rms below the d-c level.

TELEVISION I-F COIL DESIGN

Nomograph gives number of close-wound turns required to get desired inductance in range of values of interest to designers of coils for television, f-m and radar i-f transformers, eliminating considerable computational labor

By
JEAN HOWARD FELKER

THIS nomograph is based on a modification of H. A. Wheeler's inductance formula[1]

$$L = \frac{r^2 n^2}{9r + 10l} \text{ microhenrys} \quad (1)$$

where r is the radius of the coil in inches, l its length in inches, and n the number of turns. In close-wound coils, l is a function of n. Substitution of nd, where d is the diameter of the wire in inches, for l in Eq. 1 gives an equation which can be solved for n to give

$$n = \frac{10dL + \sqrt{100d^2L^2 + 360r^2L}}{2r^2} \quad (2)$$

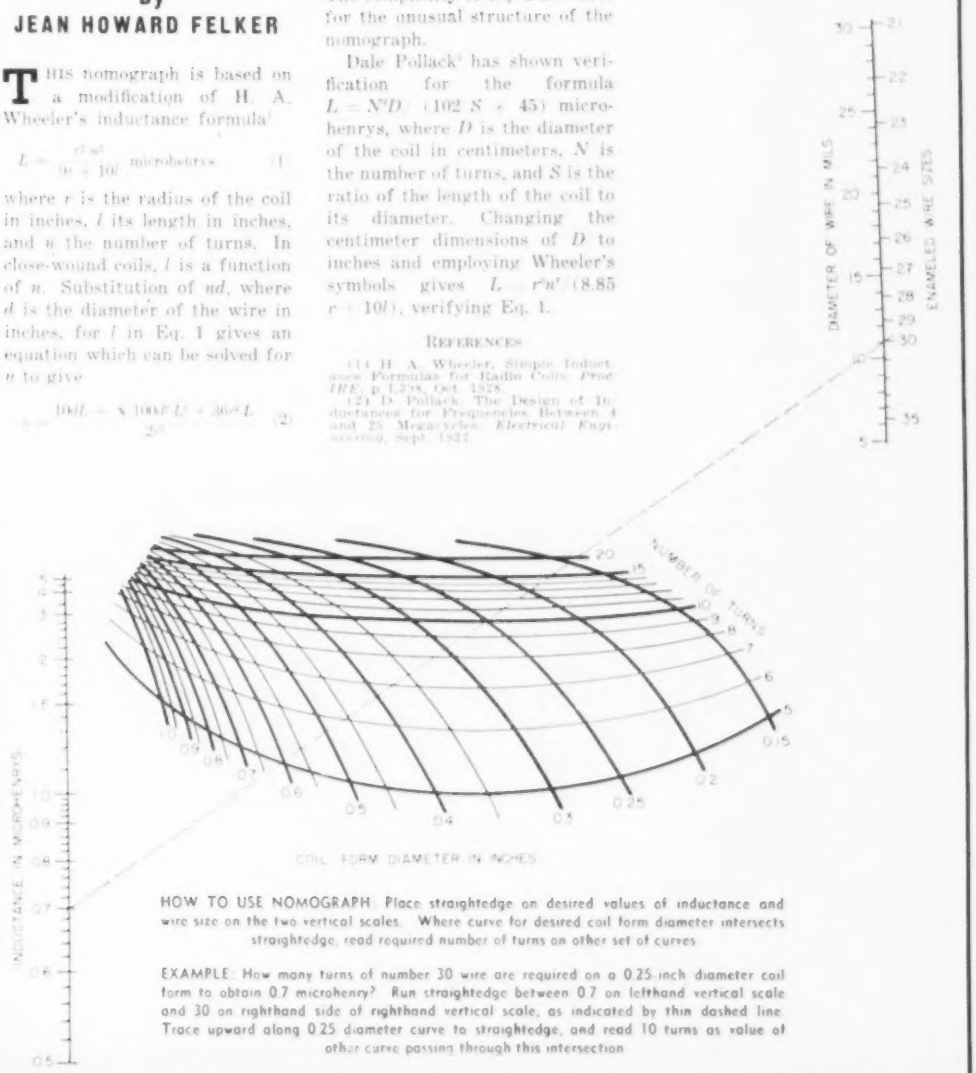
The complexity of Eq. 2 accounts for the unusual structure of the nomograph.

Dale Pollack[2] has shown verification for the formula $L = N^2D/(102S + 45)$ microhenrys, where D is the diameter of the coil in centimeters, N is the number of turns, and S is the ratio of the length of the coil to its diameter. Changing the centimeter dimensions of D to inches and employing Wheeler's symbols gives $L = r^2n^2/(8.85r + 10l)$, verifying Eq. 1.

REFERENCES

(1) H. A. Wheeler, Simple Inductance Formulas for Radio Coils. *Proc IRE*, p 1398, Oct. 1928.

(2) D. Pollack, The Design of Inductances for Frequencies Between 4 and 25 Megacycles. *Electrical Engineering*, Sept. 1937.



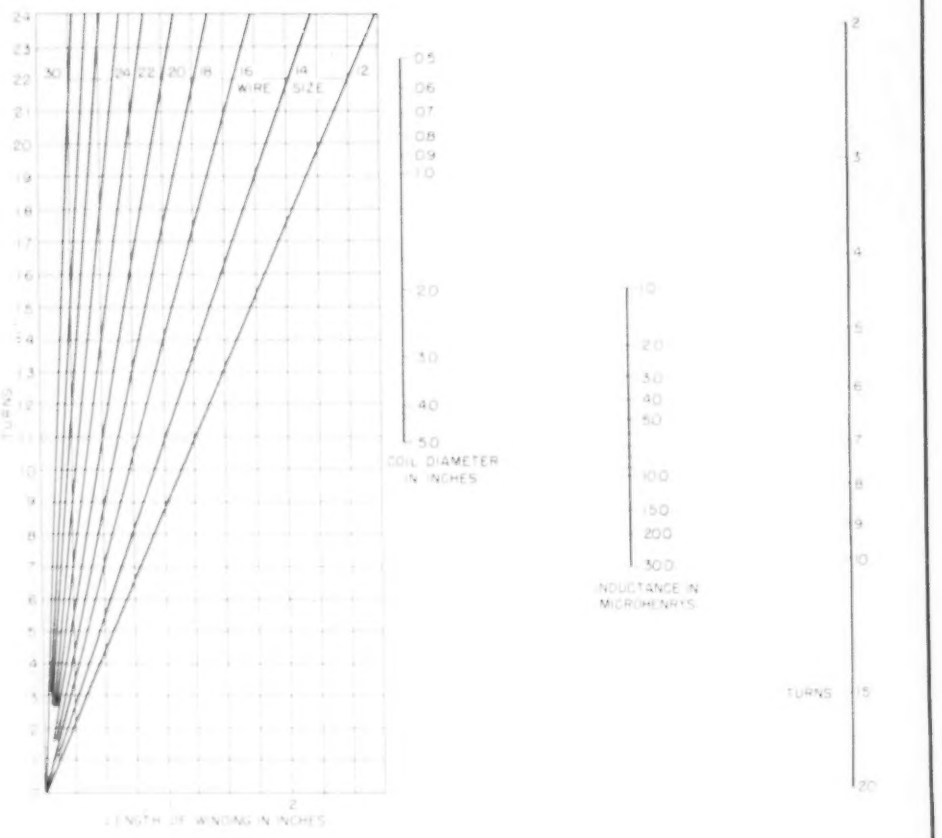
HOW TO USE NOMOGRAPH: Place straightedge on desired values of inductance and wire size on the two vertical scales. Where curve for desired coil form diameter intersects straightedge, read required number of turns on other set of curves.

EXAMPLE: How many turns of number 30 wire are required on a 0.25 inch diameter coil form to obtain 0.7 microhenry? Run straightedge between 0.7 on lefthand vertical scale and 30 on righthand side of righthand vertical scale, as indicated by thin dashed line. Trace upward along 0.25 diameter curve to straightedge, and read 10 turns as value of other curve passing through this intersection.

SHORTWAVE COIL DESIGN

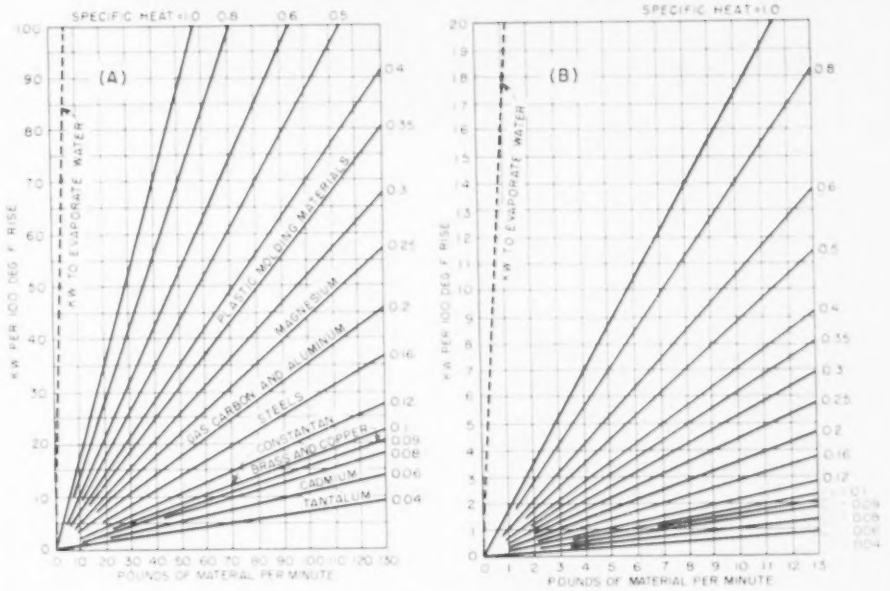
Charts give design data for inductances having highest possible Q, without cut-and-try, for optimum proportion wherein length of winding is equal to half its diameter. Design is based on information published by Dale Pollack in Sept. 1937 *Electrical Engineering*

By FREDERICK C. EVERETT



Nomograph at right gives required number of turns for any desired inductance. Chart at left gives optimum size of wire, using half of diameter for length; coil should be wound so wire occupies entire length of winding

ELECTRONIC HEATING GRAPHS



Thermal power versus heating rate for materials of various specific heats. The two graphs are identical except that the one at the right is used for more accurate results with small quantities

Curves give power needed to attain desired temperature rise at given rate for materials having specific heats ranging from 0.04 to 1.0, when using either induction or dielectric heating. Separate curves cover evaporation of water

By A. P. BOCK

THE POWER required to attain a given temperature rise at a given rate depends directly upon the number of pounds of material, the specific heat, the number of degrees temperature rise, and inversely upon the number of minutes in which the heating is to be accomplished. Neglecting heat radiation and convection losses, which are usually insignificant below 1,500 F, the pertinent power-temperature rise information is presented in a series of curves which are plots of kw per 100 deg F = 1.758 (lb per min) × specific heat.

The dashed curve represents power needed to evaporate water and reads directly from the vertical scale in each graph. The evaporation curve is a plot of kw = 17.05 lb per min water evaporated.

Examples

Suppose it is desired to heat 50 pounds of steel per minute from 50 F to 1,350 F. Using a specific heat of 0.16, a value of 14 kw per 100-deg rise is obtained from graph A. Then for 1,300 deg rise, 13 × 14 or 182 kw of thermal power is required.

In another case, it may be desired to heat 10 lb per min (dry weight) of preforms, such as general-purpose molding compound, from 70 F to 270 F. Suppose this material contains 2-percent moisture, all of which will be evaporated by the time 270 F is reached. Using a specific heat of 0.35, a value of 6.1 kw per 100-deg rise is obtained from graph B. Then for 200-deg rise, 2 × 6.1 or 12.2 kw of thermal power is required to heat the dry material.

Two more factors of required power enter in owing to the moisture. In raising 0.2 lb of water per min from 70 F to 212 F or 142-deg rise, and using a specific heat of 1.0 for water, we have 0.35 kw per 100-deg rise or 0.5 kw for 142-deg rise. In evaporating 0.2 lb of water per min, the dashed-line curve of graph B indicates that 3.4 kw is needed. The sum of these products, then, totals 16.1 kw.

DESIGN OF R-F HEAT-TREATMENT

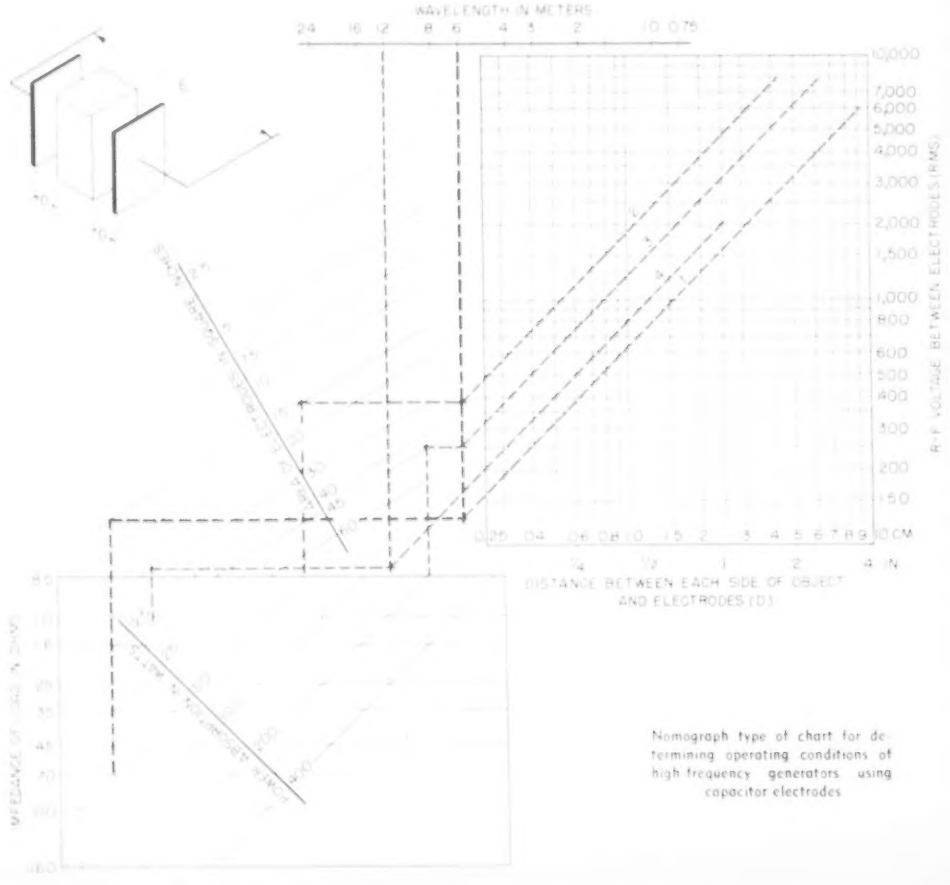
By EUGENE MITTELMAN

THE principal difficulty in the design of generators using the capacitive field method for r-f heat treatment is due to the characteristic potential distribution in the output circuit of such generators. The actual r-f potential across the object itself is a small fraction of the total high-frequency voltage across the electrodes. The potential distribution is a rather complicated function of a great number of variables including the wavelength, the capacitance between the electrodes and the object (which in turn is a function of the size of the electrodes, their distance from the object and the dielectric constant of the space between the electrodes), and the conductivity and dielectric constant of the object itself.

In general, both in the industrial and in the electromedical fields of application, the load impedance represented by the object is small compared to the reactances of the coupling capacitances between object and electrodes, hence the necessity for an excessively high-frequency voltage across the electrodes for the achievement of a certain required power absorption by the object.

Chart Design

The chart is designed to give the high-frequency voltage E across the electrodes as a function of the distance D between



Nomograph type of chart for determining operating conditions of high frequency generators using capacitor electrodes

GENERATORS

Chart gives directly the effect of changes in electrode spacing and other operating parameters. Many heat-treatment generators using capacitive electrodes do not produce expected power output because of improper coupling to the load

object and electrodes for any arbitrary values of the other variables as parameters. The chart may also be used to determine the power designated in the load when the area of the electrodes and the load impedance are known. It shows up the limitations of the capacitor field method especially when large spacing is required. On the other hand, it demonstrates that under favorable conditions considerable power absorption may be obtained even with relatively low values of the high-frequency voltage across the electrodes. This latter fact is of special importance in the design of some special-purpose generators.

As the maximum available high-frequency voltage in the tank circuit of an oscillator is about 0.9 the plate voltage or 1.8 in case of the push-pull type generators, the chart will prove helpful in the proper choice of the oscillator tubes.

Use of Chart

Select the lines of desired power absorption and load impedance at the lower left corner of the chart. From their intersection erect a vertical line and extend upward to the 30-deg line corresponding to the correct electrode area. From this intersection project horizontally to an intersection with a vertical line drawn through the proper wavelength on the wavelength scale. Through this last intersection point, a 45-deg line extending into the grid of logarithmic scales will give the r-f potential as a function of the electrode spacing. For dielectrics between object and electrodes, having constants greater than unity, the readings on the horizontal scale, giving the distances between object and electrodes, must be divided by the dielectric constant.

Examples of Use of Chart

The correct use of the chart can be best explained by solving several examples.

(1) Given a generator with wavelength of 6 meters and a pair of electrodes 15 square inches in area, determine the voltage across the electrodes for a 70-ohm load to absorb 50 watts, provided the spacing between object and electrodes is one inch on both sides. From line 1 corresponding to this case we read off 1,600 volts rms. The voltages for other spacings may be taken from the same line.

(2) Given the same wavelength and the same geometrical conditions, a load impedance of 8.5 ohms, and a desired power absorption of 50 watts, find the r-f voltage across the electrodes. From line 2 we find the voltage must be increased to 3,700 volts rms.

(3) The power absorption can be increased greatly, even with less r-f voltage across the electrodes, if the area of the electrodes is increased. Line 3 corresponds to a 6-meter generator yielding 200 watts power absorption in a 8.5-ohm load between two electrodes whose area is 45 square inches.

(4) With a 12-meter generator the maximum available r-f voltage, with electrodes whose area is 30 square inches, shall be 2,000 volts rms. What power absorption can be expected if a load of 10 ohms equivalent impedance is placed between the electrodes separated by 2.5-cm (1-inch) air spacing on each side of the electrodes? We find the answer by drawing a straight line at 45 degrees through the point corresponding to 2,000 volts and 2.5 cm (1 inch) on the graph (line 4) until it intersects the vertical 12-meter line. From here draw a horizontal to the 30-square-inch line and project down to the 10-ohm line. The power absorption will not exceed about 14 watts.

The physical arrangement of the chart is such that any of the variables can be taken as the independent factors merely by entering the chart at the right place. This feature is of particular advantage when the exact operating conditions are not known, and when several factors may be varied to obtain the desired power absorption.

Thus, for example, increasing the area of the electrodes increases the power absorption (all other factors remaining constant) in proportion to the increase in electrode area. Likewise, by halving the wavelength, the power absorption is doubled, if this is the only change in operation. Doubling the distance between electrodes and object means that the voltage must be doubled to maintain the same power absorption. Conversely, for a given impedance and power absorption, the voltage of the generator must be doubled if the spacing, D, is doubled.

As a result of many actual measurements on practical generators, it is found that the chart gives results in good agreement with practice.

R-F POWER-AMPLIFIER DESIGN CHART

By E. H. SCHULZ

THE method described here is based on the following assumptions:

1. The I_p-E_c curves are parallel and equidistant for equal grid bias increments in the positive grid region.

2. $I_p = k(e_c + e_p/\mu)$.

3. The amplification factor, μ, is a constant.

In addition, the grid current and the peak plate current must be approximated.

Symbols are as follows:

I_m = peak plate current.
I_1 = peak value of fundamental component of plate current.
I_2 = peak value of second harmonic component of plate current.
$I_{b,c}$ = d-c plate current.
E_b = plate supply voltage.
E_c = grid bias voltage.
E_g = peak input from driver stage.
E_p = peak output voltage.
$E_{p\,min}$ = minimum value of plate voltage.
$E_{g\,max}$ = maximum positive value of grid voltage.
P_i = d-c plate input power.
P_o = r-f power output.
θ = angle of conduction in degrees of fundamental frequency.

If provision is made to vary the principal parts of the circuit (such as grid bias, driving voltage and load coupling) by a small amount, optimum operating conditions may be obtained. Although the method is outlined for class-C design, it may be used for class-B design by making the angle of conduction equal to or slightly larger than 180 degrees.

Since the allowable peak plate current is not given by the tube manufacturer, it must be approximated by multiplying the emission as given in Table I by the filament heating power in watts. Allowance should be made for grid current (usually 10 to 20 percent). For tetrodes and pentodes, allowance should be made for screen current.

Table I — Maximum Emission Current for Various Filament Materials, to be Used in Choosing I_m

Type of filament	Maximum Emission ma per watt of heating power
Tungsten[1]	2 to 4
Thoriated Tungsten	10 to 35
Oxide Coated[2]	10 to 40

[1] Based on safety factor of 1. Multiply by 0.6 to 0.7 for linear amplifier or for modulated stage to insure linearity.
[2] Based on safety factor of 3 to 10.
[3] Based on safety factor of 5 to 15.

Table II — Comparison of Design and Experimental Values for Class C Amplifier Using Type 10 Tube

	Design	Experimental
$I_{b,c}$	60	62.5
P_o	19.6	18.8
P_i	30	31.2
$E_{g\,max}$	110	118
$E_{p\,min}$	130	123
I_g	10-12	12

E_b = 500 Volts f = 300 kc θ = 135° E_c = 138 I_m = 282 I_1 = 106

Case I. Class C Amplifier with Given Plate Input Power

1. Select tube and plate supply voltage, E_b (high values give greater efficiency but require greater driving power).

2. Determine the d-c plate current, $I_{b,c} = P_i/E_b$.

3. Select several angles of conduction between 100 deg and 130 deg (small angles give greater plate efficiency but require greater driving power). Determine the peak plate current, I_m, and the fundamental component, I_1, from $I_{b,c}$ and the chart for each angle.

4. Check I_m against allowable value.

5. Consult I_p-E_c curves and select values of $E_{g\,max}$ and $E_{p\,min}$ to give required I_m. $E_{p\,min}$ should be as small as possible for maximum efficiency, and $E_{g\,max}$ should be less than 80 percent of $E_{p\,min}$ for low driving power. In the case of tetrodes and pentodes $E_{g\,max}$ should not exceed 80 percent of the screen voltage nor should $E_{p\,min}$ be less than the screen voltage.

Since the manufacturer's I_p-E_c curves do not extend far enough into the positive grid region, some I_p-E_c curves for positive grid voltages must be sketched in by assuming that the curves for constant grid voltage increments are equidistant and parallel to the straight-line portion of the zero grid voltage curve.

6. Calculate the grid bias from

$$E_c = E_b/\mu + E_{g\,max} - E_{p\,min}/\mu\alpha,$$

where $\alpha = \dfrac{\cos(\theta/2)}{(1-\cos(\theta/2))}$ may be taken directly from the chart.

7. Calculate peak value of the driving voltage $E_g = E_c - E_{g\,max}$.

8. Calculate power output, $P_o = I_1 E_p/2$ where $E_p = E_b - E_{p\,min}$. Also calculate plate dissipation $= P_i - P_o$.

9. Assuming that the grid current is 10 to 20 percent of the plate current, determine the approximate driving power from E_g multiplied by the d-c grid current.

10. Check I_m, E_g, driving power, and plate dissipation against maximum allowable for tube.

11. Choose the angle of conduction that gives the most desirable operation from the standpoint of output, efficiency and

Approximate method of designing class-B and class-C amplifiers, giving sufficient accuracy for most engineering work. Accuracy obtainable for various operating parameters is better than 10 percent for example chosen

driving power. If desired, this may be repeated for several values of E_{cmin} and E_{cmax}.

12. Design tank circuit:

Equivalent impedance of tank, $Z_e = E_c/I_{c1}$.

$L = Z_e/2\pi fQ$ henrys.
$C = 1/(2\pi f)^2 L$ microfarads.

Q may be set arbitrarily between 10 and 15 or may be established by the allowable second harmonic as follows:

$$Q = \frac{66}{\text{percent 2nd harmonic}} \times \frac{I_2}{I_1}$$

where I_2 = second harmonic component of plate current for given θ. A large Q will give a low harmonic component but will increase the heating loss in the tank circuit.

Case II. Class C Amplifier with Given Power Output

1. Select tube and E_b as in step 1, case I.
2. Choose allowable I_m from Table I.
3. Select E_{cmin} and E_{cmax} as in step 5, case I.
4. Calculate $E_c = E_b - E_{cmin}$ and $I_1 = 2P_o/E_c$.
5. From the ratio I_1/I_m determine θ and I_b/I_m.
6. Calculate plate input $P_i = E_b I_b$ and plate dissipation $= P_i - P_o$.
7. Calculate E_c, E_{cmax}, and driving power as in steps 6, 7, and 10 of case I.
8. Repeat for several values of I_m or try different combinations of E_{cmin} and E_{cmax} for a given I_m to give better results from the standpoint of efficiency, tube life and driving power.
9. Design tank circuit as in case I.

After the tank circuit has been tuned to resonance and the grid bias and plate voltage have been adjusted to the correct values, the grid excitation voltage should be adjusted so that the correct E_{cmax} is obtained, as measured by a peak voltmeter. The coupling of the load to the tank circuit should then be increased until the desired plate current is obtained. The tank circuit should be retuned each time that the coupling is changed. Small variations from the calculated values may improve the overall operating conditions. In amplifiers using tetrodes and pentodes the tank should be tuned for maximum output rather than for minimum plate current, because the plate current is not very critical with respect to tuning.

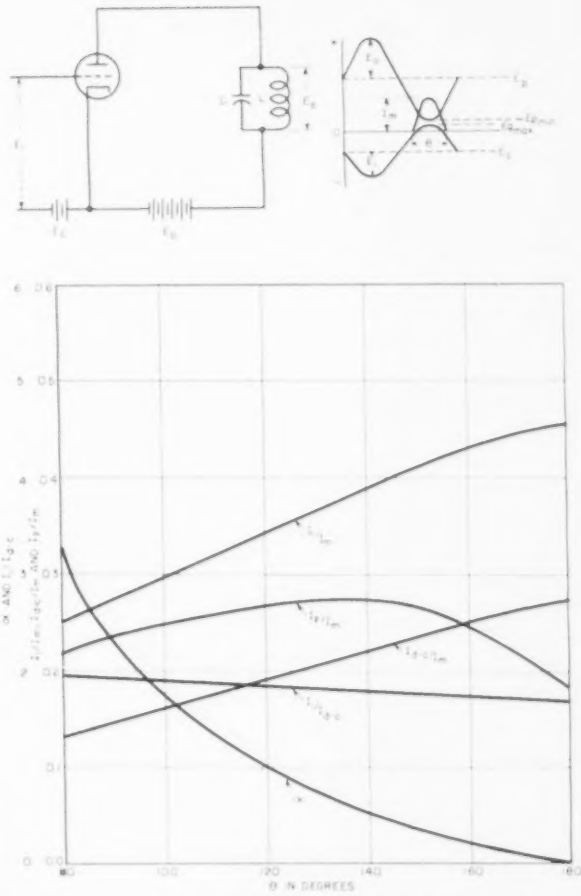


Chart giving approximate operating parameters for optimum operating conditions of class B and class C r-f power amplifiers

DESIGN OF LOUDSPEAKER DIVIDING

Four-parameter chart gives directly the required values of *L* and *C* for a parallel-connected constant-resistance dividing network, at any desired crossover frequency and line impedance, when separate low and high-frequency loudspeakers are employed

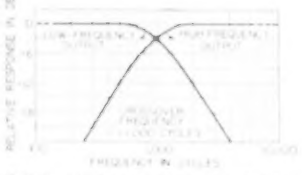


FIG. 1—Ideal transmission characteristics of a 1,000-cycle dividing network

FIG. 2—Circuit of parallel-type constant-resistance dividing network, with design equations (*L* is in henrys, *C* is in farads, *f* is crossover frequency in cycles, and *R* is impedance in ohms of input and each output branch of the network)

By EARL R. SCHULER

WITH divided-range loudspeaker systems, an electrical dividing network must be used to separate the low and high frequencies into two bands so that each may be reproduced by the proper loudspeaker unit. To approximate the ideal network transmission characteristics of Fig. 1, the parallel-type constant-resistance dividing network of Fig. 2 is favored for its simplicity since both inductors (and both capacitors) have the same values.[1] The chart in Fig. 3 gives these values of L and C directly for various values of crossover frequency f and line impedance R_0.

Although the values of L and C may be computed easily from the simple formulas given in Fig. 2, the chart will be found very useful for preliminary design problems. The chart may be used beyond the ranges shown by employing one of the following sets of multiplying factors for the scales:

R_0	f	L	C
1	10	0.1	0.1
10	1	10	0.1
10	10	1	0.01

To prevent the generation of harmonics and intermodulation products by the network, the inductance of the coils must be independent of the signal level. Since air-core inductors are inherently free of this difficulty they are usually preferred over iron-core types. They must be rather large, however, and must be wound with heavy wire in order to obtain a reasonably high Q. A value of 20 at the crossover frequency is satisfactory. Information on the design of air-core inductors may be found in the literature[2].

EXAMPLE 1: A dividing network is required for use in a 15-ohm line, the crossover frequency to be 1,000 cycles. From the point of intersection of the diagonal 15-ohm and 1,000-cycle lines on the chart, read out to the left and upper edges of the chart to the values 3.37 mh and 7.50 μf for L and C. Coils may be wound especially for this value, and standard-size capacitors may be connected in parallel to make up the required capacitance within 5 to 10 percent.

It is permissible to redesign the network for a slightly different crossover frequency to permit use of standard capacitors. New values taken off the chart, starting from the intersection of the 15-ohm and 8-μf lines, are 938 cycles and 3.60 mh.

EXAMPLE 2: A dividing network is required for use in a 600-ohm line, the crossover frequency to be 500 cycles. This installation will require the use of separate autotransformers to match the low- and high-frequency units to the 600-ohm outputs of the network. Since 600 ohms does not appear on the chart, preliminary values must be determined from the intersection of the 60-ohm and 500-cycle lines; these are found to be 27 mh and 3.75 μf. Since the value for R_0 must be multiplied by 10 and there is no change to be made in the frequency (f multiplied by 1), the conditions for determining the final values are met by applying the multiplying factors on line 2 of the table. This gives final values of 600 ohms, 500 cycles, 270 mh, and 0.375 μf for the network.

REFERENCES

(1) John K. Hilliard, Loudspeaker Dividing Networks, ELECTRONICS, p 26, Jan. 1941.

(2) "Motion Picture Sound Engineering", Chapter XX, D. Van Nostrand Co., New York, 1938.

(3) H. A. Wheeler, Simple Inductance Formulas for Radio Coils, *Proc. IRE*, p 1398, Oct. 1928.

(4) R. S. Purington, Simplified Inductance Chart, ELECTRONICS, p 51, Sept. 1942.

NETWORKS

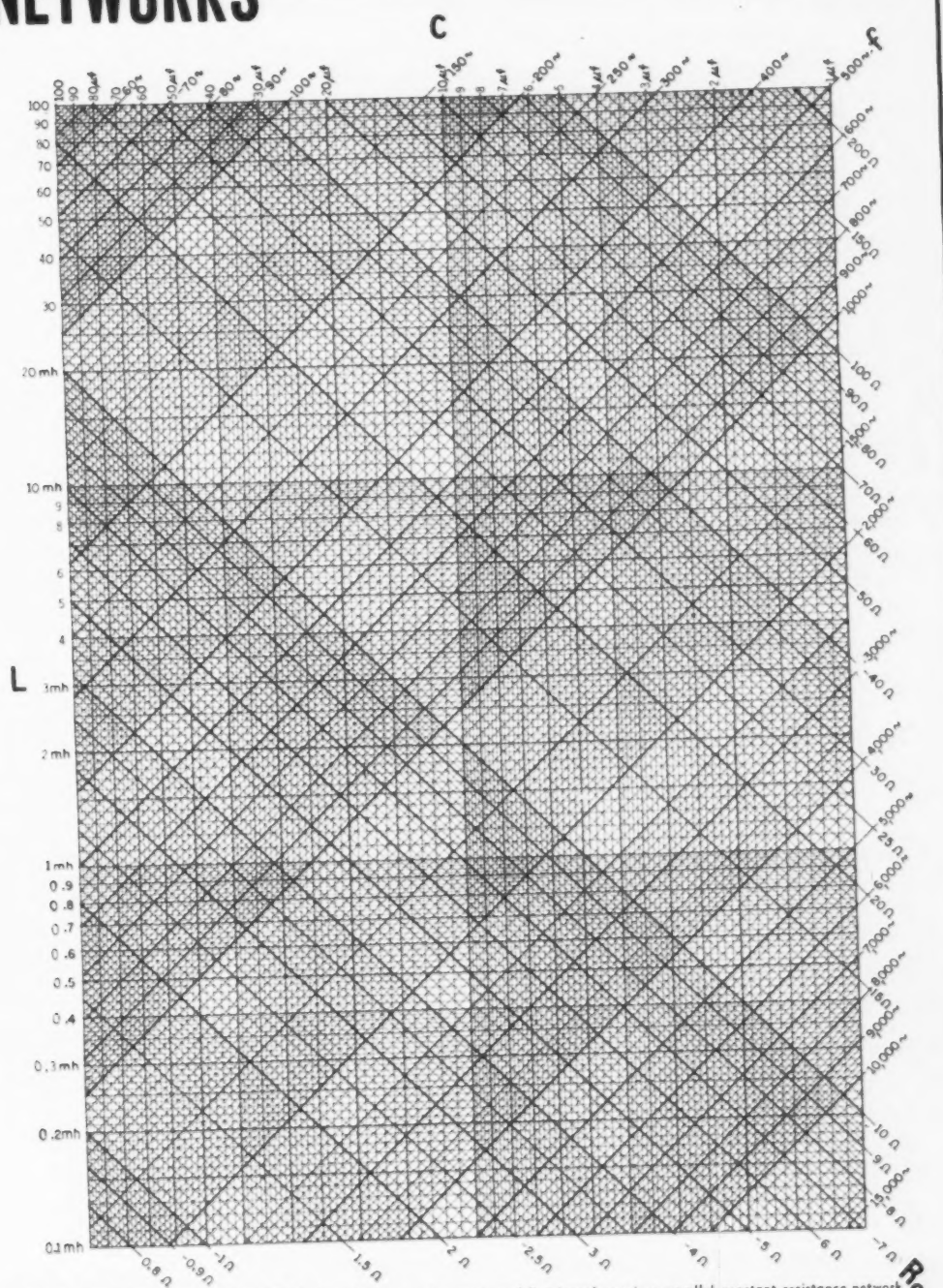


FIG. 3—Chart giving values of *L* and *C* for desired crossover frequency and line impedance in a parallel constant-resistance network

F-M and TELEVISION RECEIVING ANTENNAS

By GEORGE P. KEARSE

Type of Antenna, Length in Feet (A = 468/f_mc, B = 492/f_mc, C = 246/f_mc)	Approximate Terminal Impedance in Ohms	Radiation Pattern: Electric, in Line with Radiator	Radiation Pattern: Magnetic, Right Angles to Radiator	Gain over Dipole: Power	Gain over Dipole: Decibels	Recommended Feed Line, Application and Remarks
DIPOLE PLAIN FOLDED	72 300	Figure of eight, bidirectional broadside to elements	Circular	Unity	Zero	PLAIN—75-ohm coaxial. FOLDED—300-ohm twin-lead. Use of twin-lead to feed plain dipole gives broadband operation but extreme loss in gain; not recommended. General two-direction coverage for receiving in areas of moderate signal strength. Folded dipole slightly more broadbanded than plain. If 300-ohm twin-lead is used as radiator, do not shorten length A for propagation factor.
DIPOLE AND REFLECTOR PLAIN FOLDED	60 250	Unidirectional broadside to radiator	Half of figure 8 of eight	2 to 2½ times	3 to 4 db	PLAIN—50-ohm or 75-ohm coaxial; 75-ohm cable is more broadbanded. FOLDED—300-ohm twin-lead. Single-direction coverage, high front-to-back ratio and high gain. Recommended for use in areas of low signal strength and where single-direction radiation pattern is desired. Folded radiator slightly increases bandwidth. If array is to be used over narrow band, calculate length B at lowest frequency desired. Reducing C to 0.15 λ (in air) gives higher gain but lowers impedance and reduces bandwidth.
DIPOLE, REFLECTOR, AND DIRECTOR PLAIN FOLDED	20 to 30 80 to 120	Unidirectional broadside to radiator	Half of figure of eight	2½ to 4 times	4 to 6 db	PLAIN—50-ohm coaxial. If better impedance match is desired, use quarter-wave matching transformer; impedance of transformer should be square root of product of line and antenna impedances. FOLDED—75-ohm coaxial or 95-ohm twin coaxial. Single-direction coverage, high front-to-back ratio and high gain. Very frequency-sensitive. Narrow bandwidth. Recommended for use in areas of very low signal strength and for one frequency only. Spacing is λ/4, reducing C to 0.15λ for reflector and 0.1λ for director (in air) increases gain but reduces impedance to 8 to 10 ohms for plain and 30 to 40 ohms for folded dipole.
STACKED DIPOLES PLAIN FOLDED	35 to 40 150	Figure of eight, bidirectional broadside to elements	Figure of eight, bidirectional broadside to elements	2 to 2½ times	3 to 4 db	PLAIN—50-ohm coaxial. FOLDED—150-ohm twin-lead. Quarter-wave matching transformer may be used for 300-ohm twin-lead if desired, but will be frequency-sensitive. High-gain array for use in areas of low signal strength and where two-direction coverage is needed. Useful over moderate frequency band. Value of B may be reduced to λ/8 (in air) if desired, with a reduction in gain.
STACKED DIPOLES AND REFLECTORS PLAIN FOLDED	25 to 30 100 to 120	Unidirectional broadside to elements	Unidirectional broadside to element	4 to 5 times	6 to 7 db	PLAIN—50-ohm coaxial cable. Quarter-wave matching transformer may be used for better impedance match but will be frequency-sensitive. FOLDED—95-ohm twin coaxial cable or 150-ohm twin-lead. High-gain array for use in areas of low signal strength and where single-direction coverage is desired. Useful over relatively narrow band. Value of C may be reduced to 0.15 λ (in air) with no increase in gain. Value of impedance will be lower and array will be more frequency-sensitive. Value of D may be reduced to λ/8 (in air) if desired, with a reduction in gain.
TURNSTILE PLAIN FOLDED	35 to 40 150	Circular Radiation pattern changes with frequency	Figure of eight	0.7 of a dipole	−1½ db	PLAIN—50-ohm coaxial cable. FOLDED—150-ohm twin-lead. Omnidirectional coverage for use in areas of high signal strength. Low gain. Very frequency-sensitive; radiation pattern approximates dipole pattern rotated 45° from axis of either dipole when operated off frequency. With this array, two dipoles are connected together with a quarter-wave phasing section of 75-ohm coaxial cable for plain dipoles and 300-ohm twin-lead for folded dipoles. Length of phasing section must be corrected for propagation constant of line used.

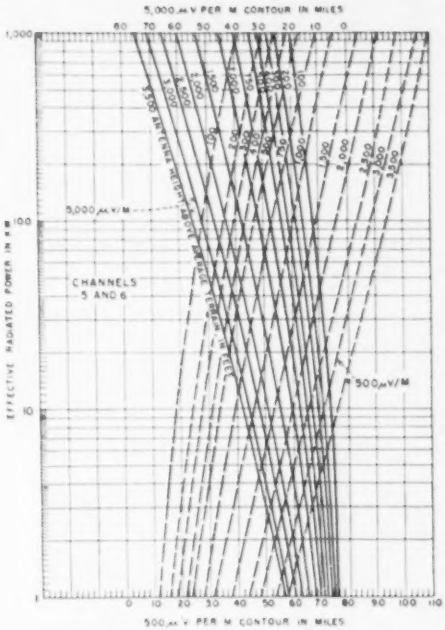
TV SERVICE AREAS

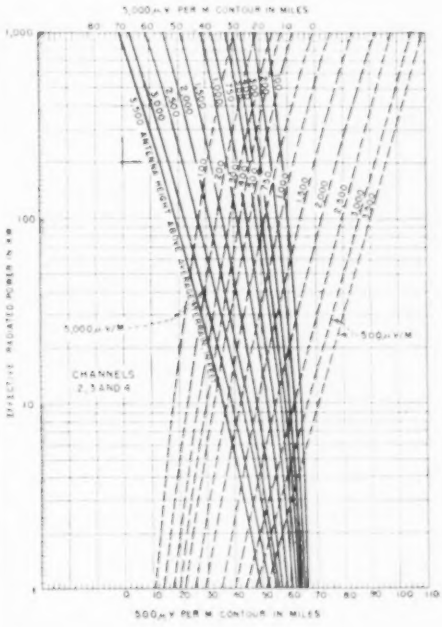
By JOHN H. BATTISON

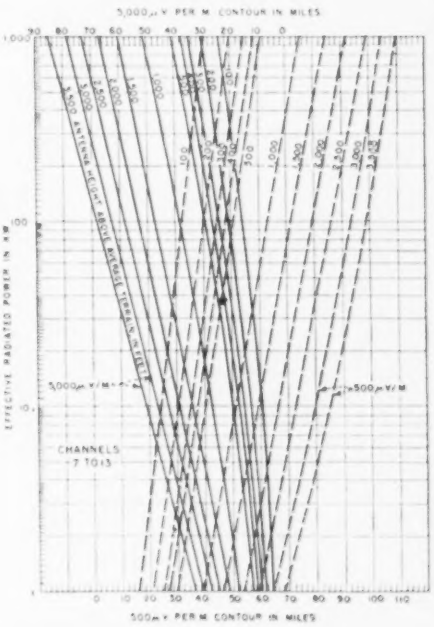
THESE charts, based upon FCC assumptions and data, provide a quick approximation of television service areas for the 5,000 μv-per-meter (solid line) and 500 μv-per-meter (dashed line) contours. Receiving antenna height is assumed to be 30 feet above average terrain.

To determine the distance from a channel-2 20-kw transmitter 2,000 feet above average terrain to the 5,000-μv-per-meter contour, enter the appropriate chart at the left and follow the effective radiated power line across to its junction with the solid curve for 2,000 feet. Then read off the distance in miles (29 miles, in this case) from the scale at the top of the graph. The 500-μv contour from a similar transmitter would be found at 60 miles, using the dashed line for height and the lower scale of miles.

Power and antenna height necessary for desired coverage can also be determined from the charts.



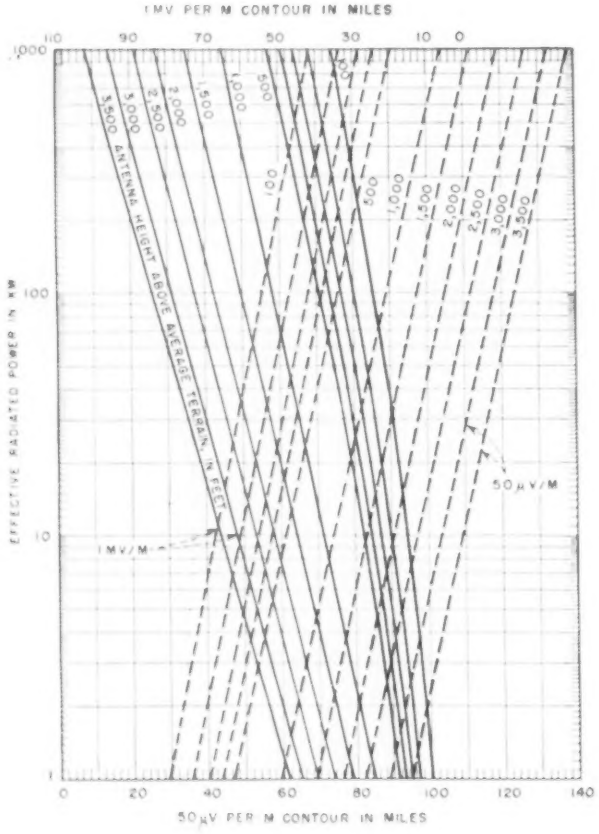

5,000 μV PER M CONTOUR IN MILES
EFFECTIVE RADIATED POWER IN KW
5,000 μV/M
500 μV/M
CHANNELS 2, 3 AND 4
500 μV PER M CONTOUR IN MILES



F-M SERVICE AREAS

Chart shows approximate distance to 1-mv-per-meter and 50-μv-per-meter contours for effective radiated powers between 1 and 1,000 kw and transmitting antenna heights from 100 to 3,500 feet above average terrain

By JOHN H. BATTISON



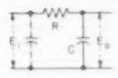
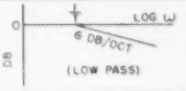
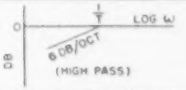
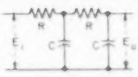
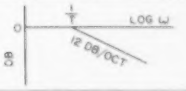
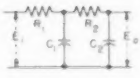
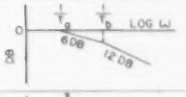
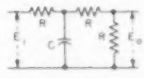
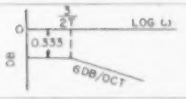
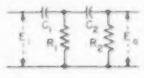
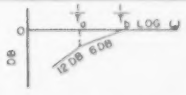
THE accompanying chart, based on FCC data, provides a quick means of determining the approximate service areas of a transmitter operating on any channel between 88 and 108 mc. Distance to the 1-mv-per-meter contour (solid lines) is shown by the upper scale and distance to the 50-μv-per-meter contour (dashed lines) by the lower scale, for various effective radiated powers and transmitting antenna heights. Receiving antenna height is assumed to be 30 feet above average terrain.

Using the Chart

To determine the distance to the 1-mv-per-meter contour with a transmitting antenna height of 2,000 feet and 20 kw of effective radiated power, enter the chart at the left and, at the point where the 20-kw horizontal line intersects the solid diagonal line labelled 2,000 feet, read on upper scale 57 miles. To determine distance to 50-μv-per-meter contour follow the same procedure but use the dashed diagonal line labelled 2,000 feet and read the lower scale.

If coverage is desired at a given distance, with a known transmitting antenna height, the effective radiated power required may be read to the left of the point of intersection of appropriate distance and height lines. Similarly, should it be necessary to determine the transmitting antenna height required to provide a certain contour with a given power the chart may be entered from the left and the bottom, and the height read from the appropriate solid or dashed line.

TRANSFER FUNCTIONS for R-C and R-L EQUALIZER NETWORKS

	NETWORK	TRANSFER FUNCTION	GAIN CURVE
(1)		$\frac{1}{1+Tp}$ $\phi = -\tan^{-1} T\omega$	
(2)		$\frac{Tp}{1+Tp}$ $\phi = 90° - \tan^{-1} T\omega$	
(3)		$\frac{1}{1+3Tp+T^2p^2}$ $\phi = -\tan^{-1} \frac{3T\omega}{1-T^2\omega^2}$	
(4)		$\frac{1}{1+(T_1+T_2+R_1C_2)p+T_1T_2p^2}$ $\phi = -\tan^{-1} \frac{(T_1+T_2+R_1C_2)\omega}{1-T_1T_2\omega^2}$	
(5)		$\frac{1}{3+2Tp}$ $\phi = -\tan^{-1} \frac{2T\omega}{3}$	
(6)		$\frac{T_1T_2p^2}{1+(T_1+T_2+R_1C_2)p+T_1T_2p^2}$ $\phi = 180° - \tan^{-1} \frac{(T_1+T_2+R_1C_2)\omega}{1-T_1T_2\omega^2}$	

Gain curves and ratios of output to input voltage are given for each of thirty different networks. Phase angle equations are included, from which phase response at several representative frequencies is readily computed

By E. W. TSCHUDI

THE accompanying tabulation of transfer functions (the ratio of output to input voltage, E_o/E_i) is the result of attempts to determine the electrical equivalent network of a pneumatic servo system and to find a satisfactory equalizer for that system. The phase angle ϕ between E_o and E_i is also given in the tables. Transfer functions of the elementary networks are included for the sake of completeness. Wherever possible the gain curves are represented by asymptotes and the corner frequency which is the intersection of these asymptotes. Where two or more corners exist, they must be of the order of a decade apart in order that the gain curve may be represented by asymptotes. When it is desired to compute the actual gain, p should be replaced by $j\omega$ in the transfer function and the amplitude computed in the usual manner for complex quantities, squaring the real and squaring the imaginary components separately, adding and taking the square root. In these expressions $T = RC$. In No. 1,

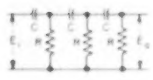
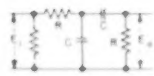
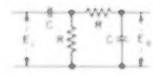
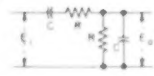
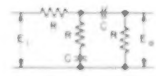
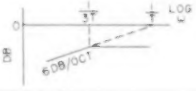
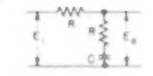
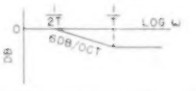
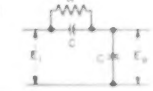
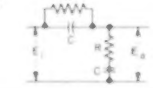
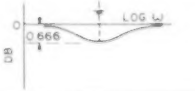
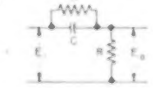
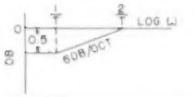
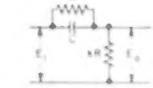
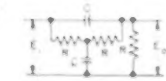
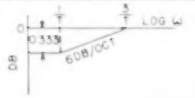
$$A = \sqrt{\frac{1}{1 + T^2\omega^2}}$$

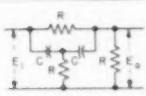
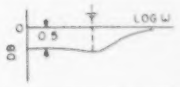
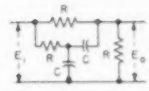
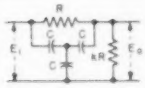
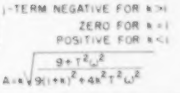
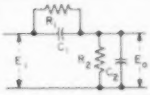
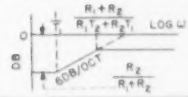
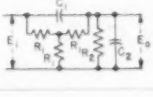
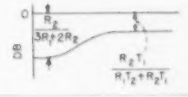
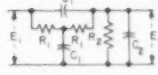
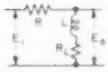
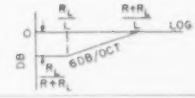
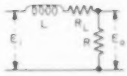
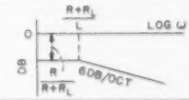
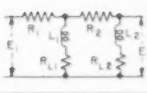
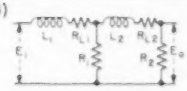
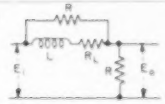
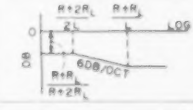
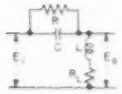
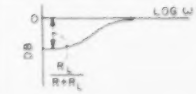
and the gain is 20 log A. In networks including inductance, the ohmic resistance of the inductance, R_L, is represented as a practical necessity. Phase response curves are not included since it is comparatively simple to compute the phase angle at several representative frequencies. In general the phase angle is positive when the associated gain increases and negative when the gain decreases.

The inclusion of phantom shunt impedances in No. 1 and 8 indicates the transfer functions are not affected by their presence. The values of T_a and T_b in the corner frequencies of No. 4 and 6 are the roots of the quadratic expressions in the denominators of these transfer functions. They are different from the two time constants T_1 and T_2 that are, respectively, R_1C_1 and R_2C_2.

(Continued on p R-38)

Transfer Functions for R-C and R-L Equalizer Networks (continued)

	NETWORK	TRANSFER FUNCTION	GAIN CURVE
(7)		$\frac{T^3p^3}{1+5Tp+6T^2p^2+T^3p^3}$ $\phi=270°-\tan^{-1}\frac{(5-T^2\omega^2)T\omega}{1-6T^2\omega^2}$	
(8)		$\frac{Tp}{1+3Tp+T^2p^2}$ $\phi=90°-\tan^{-1}\frac{3T\omega}{1-T^2\omega^2}$	
(9)		$\frac{Tp}{1+3Tp+T^2p^2}$ $\phi=90°-\tan^{-1}\frac{3T\omega}{1-T^2\omega^2}$	SAME AS 8
(10)		$\frac{Tp}{1+3Tp+T^2p^2}$ $\phi=90°-\tan^{-1}\frac{3T\omega}{1-T^2\omega^2}$	SAME AS 8
(11)		$\frac{Tp}{1+3Tp}$ $\phi=90°-\tan^{-1}3T\omega$	
(12)		$\frac{1+Tp}{1+2Tp}$ $\phi=\tan^{-1}T\omega-\tan^{-1}2T\omega$	
(13)		$\frac{1+Tp}{1+2Tp}$ $\phi=\tan^{-1}T\omega-\tan^{-1}2T\omega$	SAME AS 12
(14)		$\frac{(1+Tp)^2}{1+3Tp+T^2p^2}$ $\phi=2\tan^{-1}T\omega-\tan^{-1}\frac{3T\omega}{1-T^2\omega^2}$	
(15)		$\frac{1+Tp}{2+Tp}$ $\phi=\tan^{-1}T\omega-\tan^{-1}\frac{T\omega}{2}$	
(16)		$\frac{k(1+Tp)}{(1+k)+kTp}$ $\phi=\tan^{-1}T\omega-\tan^{-1}\frac{kT\omega}{1+k}$	
(17)		$\frac{1+Tp}{2+Tp}$ $\phi=\tan^{-1}T\omega-\tan^{-1}\frac{T\omega}{2}$	SAME AS 15
(18)		$\frac{1+Tp}{3+Tp}$ $\phi=\tan^{-1}T\omega-\tan^{-1}\frac{T\omega}{3}$	

	NETWORK	TRANSFER FUNCTION	GAIN CURVE
(19)		$\frac{(1+Tp)^2}{2+5Tp+T^2p^2}$ $\phi = 2\tan^{-1}T\omega - \tan^{-1}\frac{5T\omega}{2-T^2\omega^2}$	
(20)		$\frac{1+3Tp}{2+5Tp+T^2p^2}$ $\phi = \tan^{-1}3T\omega - \tan^{-1}\frac{5T\omega}{2-T^2\omega^2}$	
(21)		$\frac{k(3+Tp)}{3(1+k)+2kTp} = \frac{k(9(1+k)+2k\omega^2T^2+3(1-k)j\omega T)}{9(1+k)^2+4k^2\omega^2T^2}$ $\phi = \tan^{-1}\frac{T\omega}{3} - \tan^{-1}\frac{2kT\omega}{3(1+k)}$	 j-TERM NEGATIVE FOR k>1 ZERO FOR k=1 POSITIVE FOR k<1 $A = k\sqrt{\frac{9+T^2\omega^2}{9(1+k)^2+4k^2T^2\omega^2}}$
(22)		$\frac{R_2(1+T_1p)}{(R_1+R_2)+(R_1T_2+R_2T_1)p}$ $\phi = \tan^{-1}T_1\omega - \tan^{-1}\frac{(R_1T_2+R_2T_1)\omega}{R_1+R_2}$	
(23)		$\frac{R_2(1+3T_1p)(1-T_2p)}{(3R_1+2R_2)+R_2(3T_1-2T_2)p-3T_2(R_1T_2+R_2T_1)p^2}$ $\phi = \tan^{-1}3T_1\omega - \tan^{-1}T_2\omega - \tan^{-1}\frac{R_2(3T_1-2T_2)\omega}{3R_1+2R_2+3T_2(R_1T_2+R_2T_1)\omega^2}$	
(24)		$\frac{R_2[1+(2T_1-T_2)p+T_1(T_1-2T_2)p^2-T^2T_2p^3]}{(2R_1+R_2)+(R_1T_1+3R_2T_1-R_2T_2)p+(R_2T_1^2-3R_2T_1T_2-2R_1T_2^2)p^2-T_1(R_1T_2^2+R_2T_1T_2)p^3}$ $\phi = \tan^{-1}\frac{(2T_1-T_2+T^2T_2\omega^2)\omega}{1-T_1(T_1-2T_2)\omega^2} - \tan^{-1}\frac{[R_1T_1+3R_2T_1-R_2T_2+T_1(R_1T_2^2+R_2T_1T_2)\omega^2]\omega}{2R_1+R_2-(R_2T_1^2-3R_2T_1T_2-2R_1T_2^2)\omega^2}$ (LEADING ANGLE)	
(25)		$\frac{R_L+Lp}{R+R_L+Lp}$ $\phi = \tan^{-1}\frac{L\omega}{R_L} - \tan^{-1}\frac{L\omega}{R+R_L}$	
(26)		$\frac{R}{R+R_L+Lp}$ $\phi = -\tan^{-1}\frac{L\omega}{R+R_L}$	
(27)		$\frac{(R_{L1}+L_1p)(R_{L2}+L_2p)}{[(R_1+R_{L1})(R_2+R_{L2})+R_1L_2]+[(R_1+R_{L1})L_2+(R_2+R_{L2})L_1+R_1L_1]p+L_1L_2p^2}$ $\phi = \tan^{-1}\frac{L_1\omega}{R_{L1}} + \tan^{-1}\frac{L_2\omega}{R_{L2}} - \tan^{-1}\frac{[(R_1+R_{L1})L_2+(R_2+R_{L2})L_1+R_1L_1]\omega}{(R_1+R_{L1})(R_2+R_{L2})+R_1L_1-L_1L_2\omega^2}$	
(28)		$\frac{R_1R_2}{[(R_1+R_{L1})(R_1+R_2+R_{L2})+R_1^2]+[(R_1+R_{L1})L_2+(R_1+R_2+R_{L2})L_1]p+L_1L_2p^2}$ $\phi = -\tan^{-1}\frac{[(R_1+R_{L1})L_2+(R_1+R_2+R_{L2})L_1]\omega}{(R_1+R_{L1})(R_1+R_2+R_{L2})+R_1^2-L_1L_2\omega^2}$	
(29)		$\frac{R+R_L+Lp}{R+2R_L+2Lp}$ $\phi = \tan^{-1}\frac{L\omega}{R+R_L} - \tan^{-1}\frac{2L\omega}{R+2R_L}$	
(30)		$\frac{(R_L+Lp)(1+Tp)}{(R+R_L)+(R_1T+L)p+LTp^2}$ $\phi = \tan^{-1}\frac{L\omega}{R_L} + \tan^{-1}T\omega - \tan^{-1}\frac{(R_1T+L)\omega}{R+R_L-LT\omega^2}$	

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COMPILED BY THE RESEARCH DEPARTMENT OF ELECTRONICS

DIRECTORY SECTION
OF THE 1950-1951
electronics
BUYERS' GUIDE

In the preparation of ELECTRONICS BUYERS' GUIDE, every effort was made to insure the completeness and accuracy of the Directory listings according to the information provided by the manufacturers.

The listings were compiled from information provided by more than 2,500 companies manufacturing electronic or allied products and include all products that will be available in the coming year, insofar as the companies themselves can determine. The completeness and accuracy of the listings are entirely due to the helpful cooperation of these manufacturers.

Products are arranged and indexed in a simple, easy-to-find, telephone-book style. Names of Manufacturers who are advertisers in the BUYERS' GUIDE are bold-faced in the listings and page numbers of their advertisements are shown. This makes it possible to obtain complete information on products quickly and easily by referring to the advertising pages.

Several new product headings have been added. Due to lack of sufficient information, only manufacturers who were known are included under these new headings. Listings include an index of registered trade names and an alphabetical listing of all companies engaged in the manufacture of electronic components, complete equipment or allied products.

THIS SYMBOL . . . **. . . before a manufacturer's name in the listings indicates that the product is . . . In Production • Available Within a Reasonable Time • Unrestricted for General Industrial Use**

NOTE: *This punch-out tab is for your convenience in locating the Directory Section of this issue. Simply push out and fold under. It will then serve as a tab mark to indicate where the listings start.*

PUSH OUT AND FOLD

Directory Section

Alphabetical Listings Of All COMPONENTS–COMPLETE UNITS–ALLIED PRODUCTS Used in Electronic Equipment for All Purposes

The complete electronic and allied product lines of more than twenty-five hundred manufacturers are arranged and indexed in a simple, easy-to-use, telephone book style in the following listings.

Products are listed alphabetically by generic names followed by descriptive or type names where necessary, as ADAPTERS—Battery.

For example: To find the manufacturers of wax impregnated capacitors you would turn to the generic product heading CAPACITORS and listed alphabetically under that you would find CAPACITORS—Wax Impregnated.

The only exceptions are INSULATING COMPOUNDS; INSULATION MATERIALS; INSULATION PARTS; METALS; PLASTIC MATERIALS; and TUBE PARTS. Products falling in these classifications are arranged alphabetically under those six headings.

Cross references are provided wherever necessary to cover names, other than the standard ones, that are sometimes used.

Manufacturers under each product heading are also arranged alphabetically. Those companies who are advertisers in this issue are bold-faced and the page numbers of their advertisements given to permit quick and easy reference for the necessary technical data.

In compiling the listings for this year's ELECTRONICS BUYERS' GUIDE extreme care has been taken to ascertain those products which are in production, or available within a reasonable time and, unrestricted for general industrial use. They are identified in the listings by the following symbol . . .

This symbol before a manufacturer's name in the listings indicates that the product is—In Production ● Available Within a Reasonable Time ● Unrestricted for General Industrial Use

ABRASIVES

- Carborundum Co., The, Globar Div., Niagara Falls, N. Y.
- CLEVELAND CONTAINER CO., THE, 6201 Barberton Ave., Cleveland 2, Ohio. ADV. PG. 261.
- Diamond Drill Carbon Co., 51-61 Park Row, New York 7, N. Y.
- Ideal Industries, Inc., Park & Borden Aves., Sycamore, Ill.
- Linde Air Products Co., Unit of Union Carbide and Carbon Corp., 30 E. 42nd St., New York 17, N. Y.
- Norton Chemical Co., 24 E. Madison St., Chicago 2, Ill.
- MICO INSTRUMENT CO., 80 Trowbridge St., Cambridge 38, Mass. ADV. PG. 263.
- Minnesota Mining & Mfg. Co., 900 Fauquier Ave., St. Paul 6, Minn.
- Norton Co., 1 New Bond St., Worcester 6, Mass.
- U. S. Rubber Co., 1230 Avenue of the Americas, New York 20, N. Y.

ACCELEROMETERS

- Bendix Aviation Corp., Pacific Division, 11600 Sherman Way, N. Hollywood, Calif.
- Gulfsene Co., The, 751 Main St., Winchester, Mass.
- Consolidated Engineering Corp., 620 N. Lake Ave., Pasadena, Calif.
- FLADER, INC., FREDERIC, North Tonawanda, N. Y. ADV. PG. 270.
- GULTON MFG. CORP., Metuchen, N. J. ADV. PG. 262.
- Hastings Instrument Co., Box 1275, Hampton, Va.
- Hathaway Instrument Co., 1315 S. Clarkson St., Denver 10, Colo.
- KAY ELECTRIC CO., 14 Maple Ave., Pine Brook, N. J. ADV. PG. 263.
- Manta Laboratories, 3868 Carnegie St., Cleveland, Ohio
- Miller Corp., Wm., 363 W. Colorado St., Pasadena, Calif.
- North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
- Schaevitz Engineering, Crescent Blvd., at Drexel Ave., Pennsauken Township, Camden 11, N. J.
- Statham Laboratories, Inc., 9326 Santa Monica Blvd., Beverly Hills, Calif.
- Trans-Sonics, Inc., Bedford Airport, Bedford, Mass.

ADAPTERS—*Battery*

- AEROLITE ELECTRONIC HARDWARE CORP., 507 24th St., Union City, N. J. ADV. PG. 238.
- ALDEN PRODUCTS CO., 117 N. Main St., Brockton 64, Mass. ADV. PG. 235.
- Eby Inc., Hugh H., 4700 Stenton Ave., Philadelphia 44, Pa.
- J. F. D. MFG. CO., 6101-23 Sixteenth Ave., Brooklyn, N. Y. ADV. PG. 254, 264.

ADAPTERS—*Foreign*

- Consolidated Wire & Associated Companies, 2635 S. Clinton St., Chicago 16, Ill.
- Eagle Electric Mfg. Co., Inc., 23-10 Bridge Plaza S., Long Island City, N. Y.
- GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
- Hicks Electric Mfg. Co., Inc., 30 South St., Mt. Vernon, N. Y.
- Morse Co., Frank W., 1300 Soldiers Field Rd., Boston 35, Mass.
- Wood Electric Co., Inc., C. D., 70-17 83rd St., Glendale, L. I., N. Y.

ADAPTERS—*Panoramic*

- PANORAMIC RADIO PRODUCTS, INC., 10 South Second Ave., Mt. Vernon, N. Y. ADV. PG. 270.
- Varo Mfg. Co., Inc., Box 638, Garland, Texas.

ADAPTERS—*Phase*

- Varo Mfg. Co., Inc., Box 638, Garland, Texas.

ADAPTERS—*Short Wave for Radio*

- ABC Radio Labs., 3334 N. New Jersey St., Indianapolis 5, Ind.
- Radio Transceiver Labs., 116-23 Jamaica Ave., Richmond Hill 18, N. Y.

ADAPTERS—*Test*

- ALDEN PRODUCTS CO., 117 No. Main St., Brockton 64, Mass. ADV. PG. 235.
- Franklin Mfg. Corp., A. W., 43-20 34th St., Long Island City, N. Y.
- Globe Products Corp., P. O. Box 197, Southport, Conn.
- Kings Electronics Co., Inc., 811 Lexington Ave., Brooklyn 21, N. Y.
- Manufacturers Thread Grinding Inc., P. O. Box 66, Fatuntown, N. J.
- Morse Co., Frank W., 1300 Soldiers Field Rd., Boston 35, Mass.
- Spector Industries, Inc., 401 E. 138th St., New York 54, N. Y.
- Supreme, Inc., Greenwood, Miss.

ADAPTERS—*Tube*

- ALDEN PRODUCTS CO., 117 No. Main St., Brockton 64, Mass. ADV. PG. 235.
- AMERICAN PHENOLIC CORPORATION, 1830 S. 54th Ave., Chicago 50, Ill. ADV. PG. 191.
- ATOMIC INSTRUMENT CO., 160 Charles St., Boston 14, Mass. ADV. PG. 218.
- J. F. D. MFG. CO., 6101-23 Sixteenth Ave., Brooklyn, N. Y. ADV. PG. 254, 264.
- RADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 76, Inside Back and Back Covers.

ADHESIVES

- American Products Mfg. Corp., Oleander & Dublin Sts., New Orleans 18, La.
- Armstrong Cork Co., Lancaster, Pa.
- Bakelite Div., Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y.
- Borden Co., Chemical Div., 350 Madison Ave., New York 17, N. Y.
- Catalin Corp. of America, 1 Park Ave., New York 16, N. Y.
- Dolph Co., John C., Monmouth Junction, N. J.
- Durez Plastics & Chemicals Inc., 1921 Walck Rd., N. Tonawanda, N. Y.
- du Pont de Nemours & Co., Inc., E. I., Wilmington, Del.
- GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
- Main & Waldstein Co., 438 Riverside Ave., Newark 4, N. J.
- Monsanto Chemical Co., Plastics Div., Springfield 2, Mass.
- Pawley Products, Inc., 1770 Canalport Ave., Chicago 16, Ill.
- Pittsburgh Plate Glass Co., Chemical Div., Merchandise Mart Plaza, Chicago 54, Ill.
- Plaskon Division, Libbey-Owens-Ford Glass Co., 2112-24 Sylvan Ave., Toledo 6, Ohio.
- Reichhold Chemicals, Inc., 601-707 Woodward Heights Blvd., Detroit 20, Mich.
- Sauereisen Cements Co., Sauereisen Bldg., Pittsburgh 15, Pa.
- Schutt Co., Walter L., 9306 Santa Monica Blvd., Beverly Hills, Calif.
- Union Bay State Chemical Co., Cambridge, Mass.

V indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

United Shoe Machinery Corp., 140 Federal St., Boston, Mass.

V U. S. Rubber Co., 1230 Avenue of the Americas, New York 20, N. Y.

VZOPHAR MILLS, INC., 112 130 26th St., Brooklyn 32, N. Y. ADV. PG. 192

ADHESIVES—*Waterproof & Corrosion Proof Compounds*

VAmerican Products Mfg. Corp., Oleander & Dublin Sts., New Orleans 18, La.

VArmstrong Cork Co., Lancaster, Pa.

VBakelite Div., Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y.

VBorden Co., Chemical Div., 350 Madison Ave., New York 17, N. Y.

VE. I. du Pont de Nemours & Co., Inc., T. L. Willington, Del.

VForest Products & Chemicals Inc., 1401 Wurtz Road, North Tonawanda, N. Y.

VGENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273

VHarn Co., Inc., A. C., 1005 W. 65th Ave., Long Island City 1, N. Y.

VInsulation Co., 1 Broadway, New York, N. Y.

VKappers Co., Inc., Chemical Div., Kappers Bldg., Pittsburgh 19, Pa.

VLaine Chemical Co., 29 E. Madison St., Chicago 2, Ill.

VMinnesota Mining & Mfg. Co., 900 Fauquier Ave., St. Paul, Minn.

VMonsanto Chemical Co., Plastics Div., Springfield 2, Mass.

VPaisley Products, Inc., 1770 Crenshaw Ave., Chicago 16, Ill.

VSamerican Cyanamid Co., Stamerican Bldg., Pittsburgh 19, Pa.

VUnion Bay State Chemical Co., Cambridge, Mass.

VU. S. Rubber Co., 1230 Avenue of the Americas, New York 20, N. Y.

VZOPHAR MILLS, INC., 112 130 26th St., Brooklyn 32, N. Y. ADV. PG. 192

AIR CLEANERS—*Electrostatic*

VBarrington Laboratory, Box 16, Bridgehill, Conn.

VRAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257

VTrion, Inc., 1000 Liberty Ave., Mckees Rocks, Pa.

ALARM SYSTEMS

See Controls, Alarm System

ALPHA RAY SOURCES

See Isotopes

ALUMINUM OXIDE

See Insulation Materials

AMMETERS

See also Microammeters
Micro Microammeters
Milliammeters

VAssembly Products, Inc., Chagrin Falls & Ohio

VAutomatic Research, Inc., 5716 W. Bernard St., Chicago 18

VBeede Electrical Instrument Co., Inc., Penacook, N. H.

Bradley Laboratories, Inc., 145 Lexington Ave., Brooklyn 17, N. Y.

VBurlington Instrument Co., Burlington, Iowa

VCole Instrument Co., 1354 S. Grand Ave., Los Angeles 15, Calif.

VDaystrom, Inc., Archbald, Pa.

VDe Jur-Amsco Corp., Nassau Blvd., at 44th St., Long Island City 1, N. Y. ADV. PG. 257

VElectro Chicago & Mfg. Corp., Washington, Iowa

Electro-Mechanical Instrument Co., Inc., Chestnut St., Perkasie, Pa.

VEmerson Radio Co., Inc., P. O. Box 396, Indianapolis 6, Ind.

VFERRANTI ELECTRIC CO., 30 Rockefeller Plaza, New York 20, N. Y. ADV. PG. 81

Fisher Engineering Co., 1601 S. Federal St., Chicago 16, Ill.

VGENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 16

VGeneral Electronics Laboratories, Inc., 1 Main St., Cambridge 42, Mass.

VGeneral Test Equipment Co., 1146 Jersey Ave., New Brunswick, N. J.

VGeneral Transformer Mfg. Corp., 2120 Third Ave., Long Island City, N. Y.

VGuy Associates Inc., Television, N. J.

VHALLANDALE PRODUCTS, INC., 4501 W. Lake Rd., Glendale, Calif. ADV. PG. 216

VHARRISON LABORATORIES, INC., Division of Hoffman Radio Corp., 3174 W. Grand Ave., Chicago 51, Ill. ADV. PG. 17

VHeath Co., Benton Harbor, Mich. ADV. PG. 279

VHewlett-Packard Co., 395 Page Mill Rd., Palo Alto, Calif. ADV. PG. 69

VHickok Electrical Instrument Co., 10514 Dupont Ave., Cleveland 8, Ohio. ADV. PG. 277

VHoneywell Regulator Co., Industrial Div., Wayne & Windrim Aves., Philadelphia 44, Pa.

VHoskins Mfg. Co., 4445 Lawton Ave., Detroit 8, Mich. ADV. PG. 279

VHycon Mfg. Co., 2961 E. Colorado St., Pasadena 8, Calif.

VIndustrial Electronics, Inc., 2197 Woodward Ave., Detroit 1, Mich. ADV. PG. 265

VInstrument Laboratories, 123 A Avalon Place, Douglaston 10, N. Y.

VJames Lab, Inc., 1075 Morena Blvd., San Diego 10, Calif.

VKEITHLEY INSTRUMENTS, 3481 Aurora Ave., Cleveland 13, Ohio. ADV. PG. 256

VKelley Instrument Mfg. Co., Independence, Iowa

VKingsley Manufacturing Corp., 17 W. 60th St., New York 23, N. Y.

VLAVOIE LABORATORIES, Morganville, N. J. ADV. PG. 191

Lear, Inc., 110 Ionia Ave., N. W., Grand Rapids 2, Mich.

Leeds Mfg. Co., Ann Arbor, Mich.

VLenkurt Electric Co., 1105 County Rd., San Carlos, Calif.

VLevinthal Electronics, Inc., 2336 Leavenworth St., San Francisco 9, Calif.

VLine Voltage Regulator Co., 1542 S. Hope St., Los Angeles 15, Calif.

VMagnavox Co., Inc., 2131 Bueter Rd., Fort Wayne 4, Ind.

VMarion Electrical Instrument Co., Manchester, N. H. ADV. PG. 259

VMeasurements Corp., Boonton, N. J.

VMeissner Mfg. Co., Inc., 1 Main St., Mt. Carmel, Ill.

VMetals Engineering Co., 1400 Stanford Ave., Los Angeles 21, Calif.

VMicro Instrument Co., 12924 Cordary Ave., Hawthorne, Calif.

VMidwestern Instruments, Inc., 1300 W. Broadway, Tulsa, Okla.

VMinneapolis-Honeywell Regulator Co., Industrial Div., 4466 Wayzata Blvd., Minneapolis 8, Minn.

VMonitor Controller Co., 4343 Leeds Ave., Baltimore 29, Md.

VNorthern Radio Co., Inc., 143-145 W. 22nd St., New York 11, N. Y. ADV. PG. 273

VPickering & Co., 104 Woods Ave., Oceanside, L. I., N. Y. ADV. PG. 255

VPrecision Apparatus Co., 147 Hudson Ave., Brooklyn 1, N. Y.

VPyramid Instrument Corp., 49 Howard St., New York, N. Y.

VRAWSON ELECTRICAL INSTRUMENT CO., 111 Potter St., Cambridge 42, Mass. ADV. PG. 256

VReliance Instrument Co., 3027 W. Van Buren St., Chicago 12, Ill.

VRider-Smith, Bethlehem, Pa.

VSensitive Research Instrument Corp., 9 Elm Ave., Mt. Vernon, N. Y.

VSHURITE METERS, 61 Hamilton St., New Haven 8, Conn. ADV. PG. 216

VSimpson Electric Co., Div. of American Gage & Machine Co., 5200 W. Kinzie St., Chicago 44, Ill.

VSterling Mfg. Co., 9205 Detroit Ave., Cleveland 2, Ohio.

VSupreme, Inc., Greenwood, Miss.

VTriplett Electrical Instrument Co., 286 Harmon Road, Bluffton, Ohio.

VU. S. Gauge Div., American Machine & Metals, Inc., Sellersville, Pa.

VWeach Scientific Co., W. M., 1515 Sedgwick St., Chicago 10, Ill.

VWESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77

VWESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 138

VWheelco Instruments Co., 847 Harrison St., Chicago 7, Ill.

AMMETERS—*r-f*

VAssembly Products, Inc., Chagrin Falls & Ohio

VAutomatic Mfg. Corp., 85 Governeur St., Newark 4, N. J.

VCole Instrument Co., 1354 S. Grand Ave., Los Angeles 15, Calif.

VFEDERAL TELEPHONE & RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25

VGENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 16

VMeriam, Inc., 915 Westfield Blvd., Indianapolis 29, Ind.

Metropolitan Electronics & Instruments Co., 106 Fifth Ave., New York 11, N. Y.

VRAWSON ELECTRICAL INSTRUMENT CO., 111 Potter St., Cambridge 42, Mass. ADV. PG. 256

VSensitive Research Instrument Corp., 9 Elm Ave., Mt. Vernon, N. Y.

VSimpson Electric Co., Div. of American Gage & Machine Co., 5200 W. Kinzie St., Chicago 44, Ill.

VTriplett Electrical Instrument Co., 286 Harmon Road, Bluffton, Ohio.

VWESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77

VWESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 138

AMPLIFIERS—*Audio Frequency*

Amy Transformer Mfg. Corp., 2120 Third Ave., Long Island City, N. Y.

VCo-Axcudes Inc., Television, N. J.

VALDEN PRODUCTS CO., 117 N. Main St., Brockton 64, Mass. ADV. PG. 236

VALLIED RADIO CORP., 833 W. Jackson Blvd., Chicago 7, Ill. ADV. PG. 226

Amy Trans

Amy Trans

VAmpex Corp., 934 Charter St., Redwood City, Calif.

Amplifier Co., 1 Union Sq., New York, N. Y.

Amplifier Corp., 398 Broadway, New York 13, N. Y.

Amplifier Corp. of America, 396 Broadway, New York 13, N. Y.

Amplifier Electric Products, Inc., 900 W. 50th St., New York 19, N. Y.

Amplifier Laboratories, Inc., 1 Main St., Whitestone 57, N. Y.

Amplifier Manufacturing Co., 2833 13th Ave. S., Minneapolis 7, Minn.

Amplifier Service Co., 1947 Broadway, New York 23, N. Y.

Amplifier Specialties, 1113 N. Fiske St., Chicago 51, Ill.

VBALLANTINE LABORATORIES, INC., Boonton, N. J. ADV. PG. 258

VBARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 198

VBell Sound Systems, Inc., 555 Marion Rd., Columbus 7, Ohio.

VBendix Aviation Corp., Pacific Division, 11600 Sherman Way, N. Hollywood, Calif.

VBendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.

Bendix Radio Inc., 1307 Rivera Blvd., Los Angeles 22, Calif.

VBogen Co., Inc., David, 663 Broadway, New York 12, N. Y.

VBrush Development Co., 3405 Perkins Ave., Cleveland 14, Ohio.

VBurstein-Applebee Co., 1012 McGee St., Kansas City 6, Mo.

VCentralab Div. of Globe-Union Inc., 900 E. Keefe Ave., Milwaukee, Wis. ADV. PG. 64-65

VCinema Engineering Co., 1510 W. Verdugo Ave., Burbank, Calif. ADV. PG. 186

VCollins Audio Products Co., P. O. Box 368, Westfield, N. J.

VCollins Radio Co., Cedar Rapids, Iowa

VCommercial Research Labs., Inc., 20 Bartlett Ave., Detroit 3, Mich.

VConnecticut Telephone & Electric Div., Great American Industries, Inc., 70 Britannia St., Meriden, Conn.

VDow Laboratories, 139 Gordon Blvd., Floral Park, N. Y.

VEmerson Radio Co., Inc., P. O. Box 396, Indianapolis 6, Ind.

VEngineering Research Associates, Inc., 1902 W. Minnehaha Ave., St. Paul 4, Minn.

VFederal Telephone & Radio Corp., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25

VFisher Research Lab., Inc., 1961 University Ave., Palo Alto, Calif.

VGeneral Electronics Laboratories, Inc., 1 Main St., Cambridge 42, Mass.

VGeneral Transformer Mfg. Corp., 2120 Third Ave., Long Island City, N. Y.

VGuy Associates Inc., Television, N. J.

VHALLANDALE PRODUCTS, INC., 4501 W. Lake Rd., Glendale, Calif. ADV. PG. 216

VHARRISON LABORATORIES, INC., Division of Hoffman Radio Corp., 3174 W. Grand Ave., Chicago 51, Ill. ADV. PG. 17

VHarvey Radio Co., Inc., 848 Main St., Cambridge 39, Mass. ADV. PG. 48, 49

Hobbs Phone Mfg. Co., 2 Linden St., Reading, Mass.

Hartley Rev. Ltd., H. A., 102 Hammersmith Rd., London W. 14, England

VHeath Co., Benton Harbor, Mich. ADV. PG. 279

VHewlett-Packard Co., 395 Page Mill Rd., Palo Alto, Calif. ADV. PG. 69

VHickok Electrical Instrument Co., 10514 Dupont Ave., Cleveland 8, Ohio. ADV. PG. 277

VHoskins Mfg. Co., 4445 Lawton Ave., Detroit 8, Mich. ADV. PG. 279

VHycon Mfg. Co., 2961 E. Colorado St., Pasadena 8, Calif.

VIndustrial Electronics, Inc., 2197 Woodward Ave., Detroit 1, Mich. ADV. PG. 265

VInstrument Laboratories, 123 A Avalon Place, Douglaston 10, N. Y.

VJames Lab, Inc., 1075 Morena Blvd., San Diego 10, Calif.

VKEITHLEY INSTRUMENTS, 3481 Aurora Ave., Cleveland 13, Ohio. ADV. PG. 256

VKelley Instrument Mfg. Co., Independence, Iowa

VKingsley Manufacturing Corp., 17 W. 60th St., New York 23, N. Y.

VLAVOIE LABORATORIES, Morganville, N. J. ADV. PG. 191

Lear, Inc., 110 Ionia Ave., N. W., Grand Rapids 2, Mich.

Leeds Mfg. Co., Ann Arbor, Mich.

VLenkurt Electric Co., 1105 County Rd., San Carlos, Calif.

VLevinthal Electronics, Inc., 2336 Leavenworth St., San Francisco 9, Calif.

VLine Voltage Regulator Co., 1542 S. Hope St., Los Angeles 15, Calif.

VMagnavox Co., Inc., 2131 Bueter Rd., Fort Wayne 4, Ind.

VMarion Electrical Instrument Co., Manchester, N. H. ADV. PG. 259

VMeasurements Corp., Boonton, N. J.

VMeissner Mfg. Co., Inc., 1 Main St., Mt. Carmel, Ill.

VMetals Engineering Co., 1400 Stanford Ave., Los Angeles 21, Calif.

VMicro Instrument Co., 12924 Cordary Ave., Hawthorne, Calif.

VMidwestern Instruments, Inc., 1300 W. Broadway, Tulsa, Okla.

VMinneapolis-Honeywell Regulator Co., Industrial Div., 4466 Wayzata Blvd., Minneapolis 8, Minn.

VMonitor Controller Co., 4343 Leeds Ave., Baltimore 29, Md.

VNorthern Radio Co., Inc., 143-145 W. 22nd St., New York 11, N. Y. ADV. PG. 273

VPickering & Co., 104 Woods Ave., Oceanside, L. I., N. Y. ADV. PG. 255

VPrecision Apparatus Co., 147 Hudson Ave., Brooklyn 1, N. Y.

VPyramid Instrument Corp., 49 Howard St., New York, N. Y.

VRAWSON ELECTRICAL INSTRUMENT CO., 111 Potter St., Cambridge 42, Mass. ADV. PG. 256

VReliance Instrument Co., 3027 W. Van Buren St., Chicago 12, Ill.

VRider-Smith, Bethlehem, Pa.

VSensitive Research Instrument Corp., 9 Elm Ave., Mt. Vernon, N. Y.

VSHURITE METERS, 61 Hamilton St., New Haven 8, Conn. ADV. PG. 216

VSimpson Electric Co., Div. of American Gage & Machine Co., 5200 W. Kinzie St., Chicago 44, Ill.

VSterling Mfg. Co., 9205 Detroit Ave., Cleveland 2, Ohio.

VSupreme, Inc., Greenwood, Miss.

VTriplett Electrical Instrument Co., 286 Harmon Road, Bluffton, Ohio.

VU. S. Gauge Div., American Machine & Metals, Inc., Sellersville, Pa.

VWeach Scientific Co., W. M., 1515 Sedgwick St., Chicago 10, Ill.

VWESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77

VWESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 138

VWheelco Instruments Co., 847 Harrison St., Chicago 7, Ill.

AMMETERS—*r-f*

VAssembly Products, Inc., Chagrin Falls & Ohio

VAutomatic Mfg. Corp., 85 Governeur St., Newark 4, N. J.

VCole Instrument Co., 1354 S. Grand Ave., Los Angeles 15, Calif.

VFEDERAL TELEPHONE & RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25

VGENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 16

VMeriam, Inc., 915 Westfield Blvd., Indianapolis 29, Ind.

Metropolitan Electronics & Instruments Co., 106 Fifth Ave., New York 11, N. Y.

VRAWSON ELECTRICAL INSTRUMENT CO., 111 Potter St., Cambridge 42, Mass. ADV. PG. 256

VSensitive Research Instrument Corp., 9 Elm Ave., Mt. Vernon, N. Y.

VSimpson Electric Co., Div. of American Gage & Machine Co., 5200 W. Kinzie St., Chicago 44, Ill.

VTriplett Electrical Instrument Co., 286 Harmon Road, Bluffton, Ohio.

VWESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77

VWESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 138

AMPLIFIERS—*Audio Frequency*

Amy Transformer Mfg. Corp., 2120 Third Ave., Long Island City, N. Y.

VCo-Axcudes Inc., Television, N. J.

VALDEN PRODUCTS CO., 117 N. Main St., Brockton 64, Mass. ADV. PG. 236

VALLIED RADIO CORP., 833 W. Jackson Blvd., Chicago 7, Ill. ADV. PG. 226

Amy Trans

Amy Trans

VAmpex Corp., 934 Charter St., Redwood City, Calif.

Amplifier Co., 1 Union Sq., New York, N. Y.

Amplifier Corp., 398 Broadway, New York 13, N. Y.

Amplifier Corp. of America, 396 Broadway, New York 13, N. Y.

Amplifier Electric Products, Inc., 900 W. 50th St., New York 19, N. Y.

Amplifier Laboratories, Inc., 1 Main St., Whitestone 57, N. Y.

Amplifier Manufacturing Co., 2833 13th Ave. S., Minneapolis 7, Minn.

Amplifier Service Co., 1947 Broadway, New York 23, N. Y.

Amplifiers, 1113 N. Fiske St., Chicago 51, Ill.

VBALLANTINE LABORATORIES, INC., Boonton, N. J. ADV. PG. 258

VBARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 198

VBell Sound Systems, Inc., 555 Marion Rd., Columbus 7, Ohio.

VBendix Aviation Corp., Pacific Division, 11600 Sherman Way, N. Hollywood, Calif.

VBendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.

Bendix Radio Inc., 1307 Rivera Blvd., Los Angeles 22, Calif.

VBogen Co., Inc., David, 663 Broadway, New York 12, N. Y.

VBrush Development Co., 3405 Perkins Ave., Cleveland 14, Ohio.

VBurstein-Applebee Co., 1012 McGee St., Kansas City 6, Mo.

VCentralab Div. of Globe-Union Inc., 900 E. Keefe Ave., Milwaukee, Wis. ADV. PG. 64-65

VCinema Engineering Co., 1510 W. Verdugo Ave., Burbank, Calif. ADV. PG. 186

VCollins Audio Products Co., P. O. Box 368, Westfield, N. J.

VCollins Radio Co., Cedar Rapids, Iowa

VCommercial Research Labs., Inc., 20 Bartlett Ave., Detroit 3, Mich.

VConnecticut Telephone & Electric Div., Great American Industries, Inc., 70 Britannia St., Meriden, Conn.

VDow Laboratories, 139 Gordon Blvd., Floral Park, N. Y.

VEmerson Radio Co., Inc., P. O. Box 396, Indianapolis 6, Ind.

VEngineering Research Associates, Inc., 1902 W. Minnehaha Ave., St. Paul 4, Minn.

VFederal Telephone & Radio Corp., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25

VFisher Research Lab., Inc., 1961 University Ave., Palo Alto, Calif.

VGeneral Electronics Laboratories, Inc., 1 Main St., Cambridge 42, Mass.

VGeneral Transformer Mfg. Corp., 2120 Third Ave., Long Island City, N. Y.

VGuy Associates Inc., Television, N. J.

VHALLANDALE PRODUCTS, INC., 4501 W. Lake Rd., Glendale, Calif. ADV. PG. 216

VHARRISON LABORATORIES, INC., Division of Hoffman Radio Corp., 3174 W. Grand Ave., Chicago 51, Ill. ADV. PG. 17

VHarvey Radio Co., Inc., 848 Main St., Cambridge 39, Mass. ADV. PG. 48, 49

Hobbs Phone Mfg. Co., 2 Linden St., Reading, Mass.

Hartley Rev. Ltd., H. A., 102 Hammersmith Rd., London W. 14, England

VHeath Co., Benton Harbor, Mich. ADV. PG. 279

VHewlett-Packard Co., 395 Page Mill Rd., Palo Alto, Calif. ADV. PG. 69

VHickok Electrical Instrument Co., 10514 Dupont Ave., Cleveland 8, Ohio. ADV. PG. 277

VHoskins Mfg. Co., 4445 Lawton Ave., Detroit 8, Mich. ADV. PG. 279

VHycon Mfg. Co., 2961 E. Colorado St., Pasadena 8, Calif.

VIndustrial Electronics, Inc., 2197 Woodward Ave., Detroit 1, Mich. ADV. PG. 265

VInstrument Laboratories, 123 A Avalon Place, Douglaston 10, N. Y.

VJames Lab, Inc., 1075 Morena Blvd., San Diego 10, Calif.

VKEITHLEY INSTRUMENTS, 3481 Aurora Ave., Cleveland 13, Ohio. ADV. PG. 256

VKelley Instrument Mfg. Co., Independence, Iowa

VKingsley Manufacturing Corp., 17 W. 60th St., New York 23, N. Y.

VLAVOIE LABORATORIES, Morganville, N. J. ADV. PG. 191

Lear, Inc., 110 Ionia Ave., N. W., Grand Rapids 2, Mich.

Leeds Mfg. Co., Ann Arbor, Mich.

VLenkurt Electric Co., 1105 County Rd., San Carlos, Calif.

VLevinthal Electronics, Inc., 2336 Leavenworth St., San Francisco 9, Calif.

VLine Voltage Regulator Co., 1542 S. Hope St., Los Angeles 15, Calif.

VMagnavox Co., Inc., 2131 Bueter Rd., Fort Wayne 4, Ind.

VMarion Electrical Instrument Co., Manchester, N. H. ADV. PG. 259

VMeasurements Corp., Boonton, N. J.

VMeissner Mfg. Co., Inc., 1 Main St., Mt. Carmel, Ill.

VMetals Engineering Co., 1400 Stanford Ave., Los Angeles 21, Calif.

VMicro Instrument Co., 12924 Cordary Ave., Hawthorne, Calif.

VMidwestern Instruments, Inc., 1300 W. Broadway, Tulsa, Okla.

VMinneapolis-Honeywell Regulator Co., Industrial Div., 4466 Wayzata Blvd., Minneapolis 8, Minn.

VMonitor Controller Co., 4343 Leeds Ave., Baltimore 29, Md.

VNorthern Radio Co., Inc., 143-145 W. 22nd St., New York 11, N. Y. ADV. PG. 273

VPickering & Co., 104 Woods Ave., Oceanside, L. I., N. Y. ADV. PG. 255

VPrecision Apparatus Co., 147 Hudson Ave., Brooklyn 1, N. Y.

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Ⓥ PRESTO RECORDING CORP., Paramus, N. J. ADV. PG. 98, 99.

Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.

Ⓥ Radio Craftsman, Inc., 1341 S. Michigan Ave., Chicago 5, Ill.

Radio Music Corp., East Port Chester, N. Y.

Ⓥ Rauland-Borg Corp., 6523 W. Addison St., Chicago 18, Ill.

Ⓥ RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.

Ⓥ REEVES-HOFFMAN CORP., 321 Cherry St., Carlisle, Pa. ADV. PG. 32.

Ⓥ Rek-O-Kut Co., Inc., 3801 Queens Blvd., Long Island City, N. Y.

Ⓥ Remler Co., Ltd., 2101 Bryant St., San Francisco 10, Calif.

Rigis & Jeffreys, Inc., 240 Glenridge Ave., Montclair, N. J.

Ripley Co., Inc., P. O. Box 31, Middletown, Conn.

Ⓥ SANBORN CO., 39 Osborn St., Cambridge 39, Mass. ADV. PG. 219.

Ⓥ Sargent-Rayment Co., The, 212 Ninth St., Oakland 7, Calif.

Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.

Ⓥ Simpson Mfg. Co., Inc., Mark 32-28 49th St., Long Island City 3, N. Y.

Smuckler & Co., Inc., A. F., 202 Tillary St., Brooklyn 1, N. Y.

Ⓥ Somerset Laboratories, Inc., 1701 Palisades Ave., Union City, N. J.

Ⓥ Special Products Co., 9115 Brookville Rd., P. O. Box 471, Silver Spring, Md.

Ⓥ Stancil-Hoffman Corp., 1016 N. Highland Ave., Hollywood 38, Calif.

Ⓥ Standard Electronics Research Corp., 2 East End Ave., New York 21, N. Y.

Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.

Stephens Mfg. Corp., 8538 Warner Drive, Culver City, Calif.

Ⓥ Technology Instrument Corp., 1058 Main St., Waltham 54, Mass.

Telephonics Corp., Park Ave., Huntington, N. Y.

Ⓥ Tele-Video Corp., 241 Fairfield Ave., Upper Darby, Pa.

Ⓥ Thordarson Electric Mfg. Div., Maguire Industries, Inc., 500 W. Huron St., Chicago 10, Ill.

Ⓥ Transmitter Equipment Co., Inc., 345 Hudson St., New York 14, N. Y.

Ⓥ Trans-Sonics, Inc., Bedford Airport, Bedford, Mass.

Universal Broadcast Equipment Corp., 6035 Northwest Highway, Chicago 31, Ill.

Vokar Corp., 7300 Huron River Drive, Dexter, Mich.

Ⓥ Webster Electric Co., 1900 Clark St., Racine, Wis.

West Coast Electronics Co., 1601 S. Burlington St., Los Angeles 6, Calif.

Western Electro-Acoustic Labs., 621 S. Spring St., Los Angeles 14, Calif.

Western Sound & Electric Labs., Inc., 805 S. 9th St., Milwaukee 4, Wis.

Ⓥ Z & W Machine Products, Inc., Electronics Div., 5151 St. Clair Ave., Cleveland 3, Ohio.

AMPLIFIERS—*Audio Input Systems*

Acro Transformer Mfg. Corp., 21-20 33rd Ave., Long Island City, N. Y.

Ⓥ ALLIED RADIO CORP., 833 W. Jackson Blvd., Chicago 7, Ill. ADV. PG. 226.

Ⓥ Altec Lansing Corp., 161 Avenue of the Americas, New York 13, N. Y.

American Communications Corp., 306 Broadway, New York 7, N. Y.

American Electroneering Co., 2112 S. LaBrea Ave., Los Angeles, Calif.

Ampion Electric Products Inc., 500 W. 52nd St., New York 19, N. Y.

Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.

Ⓥ Bendix Aviation Corp., Pacific Division, 11600 Sherman Way, N. Hollywood, Calif.

Ⓥ Bogen Co., Inc., David, 663 Broadway, New York 12, N. Y.

Ⓥ Brook Electronics, Inc., 34 DeHart Place, Elizabeth, N. J.

Ⓥ Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.

Ⓥ CENTRALAB, DIV. OF GLOBE UNION, INC., 900 E. Keefe Ave., Milwaukee, Wis. ADV. PG. 64, 65.

Ⓥ Collins Audio Products Co., P. O. Box 368, Westfield, N. J.

Ⓥ Collins Radio Co., Cedar Rapids, Iowa.

Ⓥ Commercial Radio Sound Corp., 575 Lexington Ave., New York 22, N. Y.

Ⓥ Doolittle Radio, Inc., 7421 S. Loomis Blvd., Chicago 36, Ill.

Ⓥ ELECTRONIC MEASUREMENTS CO., Red Bank, N. J. ADV. PG. 139.

Ⓥ Electronic Workshop, Inc., 351 Bleecker St., New York 14, N. Y.

Ⓥ Fairchild Recording Equipment Corp., 154th St. & 7th Ave., Whitestone, N. Y.

Ⓥ Fisher Engineering Co., 1601 S. Federal St., Chicago 16, Ill.

Ⓥ FREED TRANSFORMER CO., INC., 1736 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 143.

Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.

Ⓥ Geotrey Mfg. Co., 171 S. 2nd St., Milwaukee 4, Wis.

Hose McCann Telephone Co., Inc., 25th St., & 3rd Ave., Brooklyn 32, N. Y.

Ⓥ Langevin Manufacturing Corp., 37 W. 65th St., New York 23, N. Y.

Ⓥ Lear, Inc., 110 Ionia Ave., NW, Grand Rapids 2, Mich.

Lyman Electronic Corp., 12 Cass St., Springfield, Mass.

Ⓥ McIntosh Engineering Laboratory, Inc., 910 King St., Silver Spring, Md.

M. P. Concert Installations, Fairfield 10, Conn.

Meissner Mfg. Div., Maguire Industries, Inc., Mt. Carmel, Ill.

Ⓥ Minnesota Electronics Corp., 97 E. Fifth St., St. Paul 1, Minn.

Ⓥ National Intercommunicating Systems, 1531 Devon Ave., Chicago 26, Ill.

Ⓥ Newcomb Audio Products Co., 6824 Lexington Ave., Hollywood 38, Calif.

Northeastern Engineering, Inc., Manchester, N. H.

Ⓥ NORTHERN RADIO CO., INC., 143-145 W. 22nd St., New York 11, N. Y. ADV. PG. 132, 133.

Ⓥ Operadio Corp., Electronic Div., 19th Albion Ave., Paterson 2, N. J.

Ⓥ PICKERING & CO., 309 Woods Ave., Oceanside, L. I., N. Y. ADV. PG. 234.

Ⓥ Precision Electronics, 641 Milwaukee Ave., Chicago 22, Ill.

Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.

Radio Music Corp., Port Chester, N. Y.

Ⓥ RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.

Ⓥ REEVES-HOFFMAN CORP., 321 Cherry St., Carlisle, Pa. ADV. PG. 32.

Ⓥ Rek-O-Kut Co., Inc., 38-01 Queens Blvd., Long Island City, N. Y.

Ⓥ Remler Co., Ltd., 2101 Bryant St., San Francisco 10, Calif.

Ripley Co., Inc., P. O. Box 31, Middletown, Conn.

Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.

Ⓥ Simpson Mfg. Co., Inc., Mark 32-28 49th St., Long Island City 3, N. Y.

Smuckler & Co., Inc., A. F., 202 Tillary St., Brooklyn 1, N. Y.

Ⓥ Stancil-Hoffman Corp., 1016 N. Highland Ave., Hollywood 38, Calif.

Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.

Stephens Mfg. Corp., 8538 Warner Drive, Culver City, Calif.

Ⓥ Thordarson Electric Mfg. Div., Maguire Industries, Inc., 500 W. Huron St., Chicago 10, Ill.

Universal Broadcast Equipment Corp., 6035 Northwest Highway, Chicago 31, Ill.

Vokar Corp., 7300 Huron River Drive, Dexter, Mich.

Ⓥ Webster Electric Co., 1900 Clark St., Racine, Wis.

West Coast Electronics Co., 1601 S. Burlington St., Los Angeles 6, Calif.

Western Sound & Electric Labs., Inc., 805 S. 9th St., Milwaukee 4, Wis.

Ⓥ Z & W Machine Products, Inc., Electronics Div., 5151 St. Clair Ave., Cleveland 3, Ohio.

AMPLIFIERS—*Audio Subminiature*

Ⓥ Walkirt Co., 3808 Marilyn Ave., Culver City, Calif.

AMPLIFIERS—*d-c*

Ⓥ ALDEN PRODUCTS CO., 117 N. Main St., Brockton 64, Mass. ADV. PG. 235.

American Communications Corp., 306 Broadway, New York 7, N. Y.

American Electroneering Co., 2112 S. LaBrea Ave., Los Angeles, Calif.

Ⓥ Amplifier Corp. of America, 396 Broadway, New York 13, N. Y.

Ⓥ Associated Research, Inc., 3758 W. Belmont, Chicago 18, Ill.

Ⓥ Atlas Coil Winders, Inc., Stamford, Conn.

Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.

Ⓥ Bivers & Co., Inc., 4712 Bethesda Ave., Bethesda, Md.

Ⓥ Brociner Electronics Lab., 1546 Second Ave., New York 28, N. Y.

Ⓥ BRUSH DEVELOPMENT CO., 3405 Perkins Ave., Cleveland 14, Ohio. ADV. PG. 124, 125.

Ⓥ C. G. S. LABORATORIES, INC., 36 Ludlow St., Stamford, Conn. ADV. PG. 244.

Ⓥ Collins Radio Co., Cedar Rapids, Iowa.

Ⓥ Electro Mechanical Research, Inc., Ridgefield, Conn.

Ⓥ Electronic Associates, Inc., Long Beach, N. J.

Ⓥ ELECTRONIC MEASUREMENTS CO., Red Bank, N. J. ADV. PG. 139.

Ⓥ ELECTRONIC TUBE CORP., 1200 E. Mermaid Ave., Philadelphia 18, Pa. ADV. PG. 156.

Ⓥ Electronic Workshop, Inc., 351 Bleecker St., New York 14, N. Y.

Ⓥ EL-TRONICS, INC., 2649 No. Howard St., Philadelphia 33, Pa. ADV. PG. 238.

Ⓥ Furst Electronics, 104 S. Jefferson St., Chicago 6, Ill.

Ⓥ Gonset Labs., Inc., 2 East End Ave., New York 21, N. Y.

Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.

Hose McCann Telephone Co., Inc., 25th St. & 3rd Ave., Brooklyn 32, N. Y.

Ⓥ Hanover Developments, 401 E. 34th St., New York 21, N. Y.

Ⓥ Industrial Control Co., 1462 Undercliff Ave., New York 52, N. Y.

Ⓥ INDUSTRIAL ELECTRONICS, INC., 2457 Woodward Ave., Detroit 1, Mich. ADV. PG. 240.

Ⓥ Instrument Laboratories, 515 W. Walton Place, Chicago 10, Ill.

Ⓥ Lear, Inc., 110 Ionia Ave., NW., Grand Rapids 2, Mich.

Ⓥ Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.

Ⓥ Linton Foib Instrument Co., 392 Slater St., Stamford, Conn.

Lyman Electronic Corp., 12 Cass St., Springfield, Mass.

M. P. Concert Installations, Fairfield 10, Conn.

Ⓥ MACDONALD & CO., INC., W. S., 33 University Rd., Cambridge 38, Mass. ADV. PG. 218.

Ⓥ Magnetic Instrument Co., 82 W. Main St., West Orange, N. J.

Ⓥ Manning, Maxwell & Moore, Inc., Stratford, Conn.

Ⓥ Miller Corp., Wm., 362 W. Colorado St., Pasadena, Calif.

Ⓥ MILLIVAC INSTRUMENTS, Box 3027, New Haven, Conn. ADV. PG. 182.

Northeastern Engineering, Inc., Manchester, N. H.

Ⓥ Offner Electronics, Inc., 5320 N. Keeler Ave., Chicago 25, Ill.

Ⓥ Perkin-Elmer Corp., The, Glenbrook, Conn.

Ⓥ Philbrick Researches, Inc., George A., 230 Congress St., Boston 10, Mass.

Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.

Ⓥ Photocon Research Products, 1062 N. Allen Ave., Pasadena 7, Calif.

Ⓥ Photron Instrument Co., 6516 Detroit Ave., Cleveland 2, Ohio.

Process & Instruments, 60 Greenpoint Ave., Brooklyn 22, N. Y.

Ⓥ RAHM INSTRUMENTS, INC., 12 W. Broadway, New York 7, N. Y. ADV. PG. 178.

Ripley Co., Inc., P. O. Box 31, Middletown, Conn.

Ⓥ SANBORN CO., 39 Osborn St., Cambridge 39, Mass. ADV. PG. 219.

Ⓥ SERVO CORP. OF AMERICA, 2020 Jericho Turnpike, New Hyde Park, N. Y. ADV. PG. 269.

Ⓥ SERVO-TEK PRODUCTS CO., 4 Godwin Ave., Paterson 1, N. Y. ADV. PG. 187.

Sherron Electronics Co., 1281 Flushing Ave., Brooklyn 6, N. Y.

Ⓥ Southwestern Industrial Electronic Co., 2831 Post Oak Rd., Houston 19, Texas.

Ⓥ Standard Electronics Research Corp., 2 East End Ave., New York 21, N. Y.

Ⓥ Tech Laboratories, Inc., Bergen & Edsall Blvds., Palisades Park, N. J.

Ⓥ Tektronix, Inc., 712 S. E. Hawthorne Blvd., Portland 14, Oregon.

Ⓥ Vickers Electric Division, Vickers Inc., 1815 Locust St., St. Louis 3, Mo.

Ⓥ WATERMAN PRODUCTS CO., INC., 2445-61 Emerald St., Philadelphia 25, Pa. ADV. PG. 252.

West Coast Electronics Co., 1601 S. Burlington St., Los Angeles 6, Calif.

Ⓥ Z & W Machine Products, Inc., Electronics Div., 5151 St. Clair Ave., Cleveland 3, Ohio.

AMPLIFIERS—*Decade*

American Electroneering Co., 2112 S. LaBrea Ave., Los Angeles, Calif.

Ⓥ BALLANTINE LABORATORIES, INC., Boonton, N. J. ADV. PG. 96.

Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.

Ⓥ Electronic Associates, Inc., Long Beach, N. J.

Ⓥ FREED TRANSFORMER CO., INC., 1736 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 143.

Ⓥ HEWLETT-PACKARD CO., 395 Page Mill Rd., Palo Alto, Calif. ADV. PG. 68, 69.

Ⓥ INDUSTRIAL ELECTRONICS, INC., 2457 Woodward Ave., Detroit 1, Mich. ADV. PG. 255.

Ⓥ Kaibfell Labs, Inc., 1076 Morena Blvd., San Diego 10, Calif.

Ⓥ KEITHLEY INSTRUMENTS, 1507 Warrenville Center Rd., Cleveland 21, Ohio. ADV. PG. 236.

Loral Electronics Corp., 294 E. 149th St., New York 54, N. Y.

M. P. Concert Installations, Fairfield 10, Conn.

Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.

Radio Music Corp., Port Chester, N. Y.

Ⓥ Standard Electronics Research Corp., 2 East End Ave., New York 21, N. Y.

Ⓥ Technology Instrument Corp., 1058 Main St., Waltham 54, Mass.

West Coast Electronics Co., 1601 S. Burlington St., Los Angeles 6, Calif.

AMPLIFIERS—*Differentiating*

Ⓥ Walkirt Co., 3808 Marilyn Ave., Culver City, Calif.

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AMPLIFIERS—*f.m & a.m Antenna*

American Communications Corp., 306 Broadway, New York 7, N. Y.
✓Brach Mfg. Corp., 200 Central Ave., Newark 4, N. J.
Crystal Devices Co., Inc., 50 Mill Rd., Freeport, N. Y.
✓Doolittle Radio, Inc., 7421 S. Loomis Blvd., Chicago 36, Ill.
Electro Engineering & Mfg. Co., 627 W. Alexandrine, Detroit 1, Mich.
✓GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 28
✓International Corp. of America, 258 William St., New York 7, N. Y.
✓Jerrold Electronics Corp., 121 N. Broad St., Philadelphia, Pa.
Monroe Coil Co., 3839 Narragansett Ave., Chicago 34, Ill.
✓Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
✓RADIO CORP. OF AMERICA, RCA Victor Div., Camden, N. J. ADV. PG. 13 to 16, Inside Back & Back Covers
Radio Music Corp., Port Chester, N. Y.
✓RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
✓SPENCER KENNEDY LABS., INC., 186 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 256
✓Television Equipment Corp., 230 William St., New York, N. Y.
West Coast Electronics Co., 1601 S. Burlington St., Los Angeles 6, Calif.

AMPLIFIERS—*Facsimile*

✓Acme Telectronics Div. of NEA Service, Inc., West Third & Lakeside, Cleveland 13, Ohio
✓ALDEN PRODUCTS CO., 117 No. Main St., Brockton 64, Mass. ADV. PG. 230
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
✓Hogan Laboratories, Inc., 155 Perry St., New York 14, N. Y.
✓Magnavox Mfg. Corp., Littleton, Mass.
✓Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
✓Press Wireless Mfg. Co., Inc., Centaqua Rd., Hicksville, L. I., N. Y.
✓TIMES FACSIMILE CORP., 229 W. 43rd St., New York 18, N. Y. ADV. PG. 52
West Coast Electronics Co., 1601 S. Burlington St., Los Angeles 6, Calif.

AMPLIFIERS—*Keying*

American Electroneering Co., 2112 S. LaBrea Ave., Los Angeles, Calif.
✓BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169
✓Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.
✓Hazeltine Inc., H. C., 915 Broadway, New York 10, N. Y.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Erco Radio Labs., Inc., E. Stewart Ave., Garden City, N. Y.
✓Eitel-McCullough, Inc., San Carlos, Calif.
✓Lear, Inc., 110 Ionia Ave., N.W., Grand Rapids 2, Mich.
✓Link Electronics Corp., 194 E. 140th St., New York 54, N. Y.
✓Millen Mfg. Corp., Inc., 150 Exchange St., Malden, Mass.
✓Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
✓Press Wireless Mfg. Co., Inc., Centaqua Rd., Hicksville, L. I., N. Y.
✓RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
✓SPERRY GYROSCOPE CO. DIV. OF THE SPERRY CORP., Great Neck, N. Y. ADV. PG. 85, 86
✓Tele-Tronics Laboratories, Inc., Bergen & Elliott Blvds., Paulsboro, N. J.
West Coast Electronics Co., 1601 S. Burlington St., Los Angeles 6, Calif.
✓Weymouth Instrument Co., 1445 Commercial St., East Weymouth 89, Mass.

AMPLIFIERS—*Microwave Radar*

American Electroneering Co., 2112 S. LaBrea Ave., Los Angeles, Calif.
✓Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
✓Hallamore Associates, Inc., Long Branch, N. J.
✓ELECTRONIC MEASUREMENTS CO., Red Bank, N. J. ADV. PG. 139
✓FEDERAL TELEPHONE AND RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 19 to 24
Lear Electronics Corp., 194 E. 140th St., New York 54, N. Y.
✓Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
✓Press Wireless Mfg. Co., Inc., Centaqua Rd., Hicksville, L. I., N. Y.
✓RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
✓SPERRY GYROSCOPE CO. DIV. OF THE SPERRY CORP., Great Neck, N. Y. ADV. PG. 85, 86
✓Tele-Tronics Laboratories, Inc., Raytheon Mfg. Co., Waltham, Mass.

AMPLIFIERS—*Musical Instrument*

American Communications Corp., 306 Broadway, New York 7, N. Y.
American Electroneering Co., 2112 S. LaBrea Ave., Los Angeles, Calif.
✓Arnold Engineering Co., 1212 E. Ellsworth, Ann Arbor, Mich.
✓Atlas Sound Corp., 1449 39th St., Brooklyn 18, N. Y.
✓Audio Devices, Inc., 444 Madison Ave., New York 22, N. Y.
✓Bell Sound Systems, Inc., 1184 Marion Rd., Columbus 7, Ohio
✓Bogen Co., Inc., David, 663 Broadway, New York 12, N. Y.
✓Brociner & Co., Inc., 4712 Bethesda Ave., Bethesda, Md.
✓CENTRALAB, DIV. OF GLOBE-UNION INC., 900 E. Keefe Ave., Milwaukee, Wis. ADV. PG. 64, 65
✓Fisher Engineering Co., 1401 S. Federal St., Chicago 16, Ill.
✓HEATH CO., Benton Harbor, Mich. ADV. PG. 279
✓Minnesota Electronics Corp., 91 E. Fifth St., St. Paul 1, Minn.
✓Magna Electronics Co., 3707-11 W. Jefferson, Los Angeles 16, Calif.
✓National Polytronics, Inc., 2419 Atlantic Ave., Brooklyn, N. Y.
✓Newcomb Audio Products Co., 6824 Lexington Ave., Hollywood 38, Calif.
✓Peerless Corp., The, 611 W. Division St., Chicago 10, Ill.
✓Scott, Inc., Herman Hosmer, 385 Putnam Ave., Cambridge 39, Mass.
✓Scott Radio Labs., Inc., 4451 N. Ravenswood Ave., Chicago 40, Ill.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
✓Simpson Mfg. Co., Inc., Mark, 32-28 49th St., Long Island City 3, N. Y.
Universal Broadcast Equipment Corp., 6035 Northwest Highway, Chicago 31, Ill.
✓Vaco Mfg. Co., 4708 W. Walton St., Chicago 51, Ill.
Vikar Corp., 7300 Huron River Drive, Dexter, Mich.
West Coast Electronics Co., 1601 S. Burlington St., Los Angeles 6, Calif.
Western Sound & Electric Labs., Inc., 805 S. 56th St., Milwaukee 4, Wis.

AMPLIFIERS—*Peak Limiting*

✓Acme Telectronics Div. of NEA Service, Inc., West Third & Lakeside, Cleveland 13, Ohio
✓Altec Lansing Corp., 161 Avenue of the Americas, New York 13, N. Y.
American Electroneering Co., 2112 S. LaBrea Ave., Los Angeles, Calif.
✓Amplifier Corp. of America, 396 Broadway, New York 13, N. Y.
✓Arlington Electric Products Inc., 500 W. 52nd St., New York 19, N. Y.
✓BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169
✓Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
✓Collins Radio Co., Cedar Rapids, Iowa
✓ELECTRONIC MEASUREMENTS CO., Red Bank, N. J. ADV. PG. 139
✓EL-TRONICS, INC., 2644 No. Howard St., Philadelphia 33, Pa. ADV. PG. 238
✓Gates Radio Co., Quincy, Ill.
✓Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
✓PRESTO RECORDING CORP., Paramus, N. J. ADV. PG. 95, 96
✓Press Wireless Mfg. Co., Inc., Centaqua Rd., Hicksville, L. I., N. Y.
✓RADIO CORP. OF AMERICA, RCA Victor Div., Semiconductor Division, Camden, N. J. ADV. PG. 13 to 16, Inside Back & Back Covers
✓RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257
✓Shure Brothers, Inc., 225 W. Huron St., Chicago 10, Ill.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
✓Stancil-Hoffman Corp., 1016 N. Highland Ave., Hollywood 38, Calif.
✓Standard Electronics Research Corp., 2 East End Ave., New York 21, N. Y.
✓Thordarson Electric Mfg. Div., Maguire Industries, Inc., 500 W. Huron St., Chicago 10, Ill.
✓Transmitter Equipment Co., Inc., 345 Hudson St., New York 14, N. Y.
West Coast Electronics Co., 1601 S. Burlington St., Los Angeles 6, Calif.

AMPLIFIERS—*Photocell*

✓Acme Telectronics Div. of NEA Service, Inc., W. Third & Lakeside, Cleveland 13, Ohio
✓Advance Electric, Box 255, Caldwell, N. J.
✓ALDEN PRODUCTS CO., 117 No. Main St., Brockton 64, Mass. ADV. PG. 230
✓Altec Lansing Corp., 161 Avenue of the Americas, New York 13, N. Y.
American Electroneering Co., 2112 S. LaBrea Ave., Los Angeles, Calif.
Arlington Electric Products Inc., 500 W. 52nd St., New York 19, N. Y.
✓Atlas Sound Corp., 1449 39th St., Brooklyn 18, N. Y.
✓ATOMIC INSTRUMENT CO., 131 Brookline St., Boston, Mass. ADV. PG. 238
✓Bogen Co., Inc., David, 663 Broadway, New York 12, N. Y.
✓Brociner & Co., Inc., 4712 Bethesda Ave., Bethesda, Md.
✓Electro Mechanical Research, Inc., Ridgefield, Conn.
✓Electronic Control Corp., 1713 E. Forest St., Detroit, Mich.
✓EL-TRONICS, INC., 2644 No. Howard St., Philadelphia 33, Pa. ADV. PG. 238
✓Fenyvessy Electronics, 1254 Willow St., Chicago 14, Ill.
✓FORD INSTRUMENT CO., INC., 31-10 Thomson Ave., Long Island City 1, N. Y. ADV. PG. 218
✓Gates Radio Co., Quincy, Ill.

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Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Hoffman Engineering Corp., Anoka, Minn.
Ⓥ Industrial Electronics Co., Inc., Hanover, Mass.
Ⓥ INDUSTRIAL ELECTRONICS, INC., 2457 Woodward Ave., Detroit 1, Mich. ADV. PG. 255.
Ⓥ Jamesbury Corp., 226 Lansing St., Utica, N. Y.
Ⓥ MACDONALD & CO., INC., W. S., 33 University Rd., Cambridge 38, Mass. ADV. PG. 216.
Ⓥ Machine-O-Matic, Inc., P. O. Box 238, Ashley, Ohio
Ⓥ Manning, Maxwell Moore, Inc., Stratford, Conn.
Ⓥ McElroy Mfg. Corp., Littleton, Mass.
Ⓥ Melaphone Corp., Rochester 2, N. Y.
Ⓥ Minnesota Electronics Corp., 97 E. Fifth St., St. Paul 1, Minn.
Ⓥ Newcomb Audio Products Co., 6824 Lexington Ave., Hollywood 38, Calif.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Photobell Company, 216 Nassau St., New York 7, N. Y.
Ⓥ POTTER INSTRUMENT CO., INC., 115 Cutter Mill Rd., Great Neck, N. Y. ADV. PG. 204.
Ⓥ Precision Electronics, 641 Milwaukee Ave., Chicago 22, Ill.
Ⓥ Riley Co., Inc., P. O. Box 31, Middletown, Conn.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Smuckler & Co., Inc., A. F., 202 Tillary St., Brooklyn 1, N. Y.
Ⓥ Standard Electronics Research Corp., 2 East End Ave., New York 21, N. Y.
Ⓥ Tech Laboratories, Inc., Bergen & Edsall Blvd., Palisades Park, N. J.
Ⓥ Thordarson Electric Mfg. Div., Maguire Industries, Inc., 500 W. Huron St., Chicago 10, Ill.
Vokar Corp., 7300 Huron River Drive, Dexter, Mich.
Ⓥ Worner Electronic Devices, Rankin, Illinois.

AMPLIFIERS—Power

Ⓥ ALDEN PRODUCTS CO., 117 N. Main St., Brockton 64, Mass. ADV. PG. 235.
Ⓥ Altec Lansing Corp., 161 Avenue of the Americas, New York 13, N. Y.
American Communications Corp., 304 Broadway, New York 7, N. Y.
American Electroneering Co., 2112 S. LaBrea Ave., Los Angeles, Calif.
Ⓥ Amplifier Corp. of America, 396 Broadway, New York 13, N. Y.
Ⓥ Applied Science Corp. of Princeton, The, P. O. Box 44, Princeton, N. J.
Arlington Electric Products Inc., 500 W. 52nd St., New York 19, N. Y.
Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ Bell Sound Systems, Inc., 555 Marion Rd., Columbus 7, Ohio
Ⓥ Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.
Ⓥ Bogen Co., Inc., David, 663 Broadway, New York 12, N. Y.
Ⓥ British Industries Corp., 164 Duane St., New York 13, N. Y.
Burnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Calbest Engineering & Electronics Co., 628 N. Highland Ave., Hollywood 38, Calif.
Ⓥ Collins Audio Products Co., P. O. Box 368, Westfield, N. J.
Ⓥ Collins Radio Co., Cedar Rapids, Iowa.
Ⓥ Doolittle Radio, Inc., 7421 S. Loomis Blvd., Chicago 36, Ill.
Ⓥ ELECTRONIC MEASUREMENTS CO., Red Bank, N. J. ADV. PG. 139.
Ⓥ Electronic Workshop, Inc., 351 Bleecker St., New York 14, N. Y.
Ⓥ EL-TRONICS, INC., 2649 No. Howard St., Philadelphia 33, Pa. ADV. PG. 238.
Ⓥ Fairchild Recording Equipment Corp., 154th St. & 7th Ave., Whitestone, N. Y.
Ⓥ Fidelity Amplifier Co., 703 Willow St., Chicago 14, Ill.
Ⓥ FORD INSTRUMENT CO., INC., 31-10 Thomson Ave., L. I. C. 1, N. Y. ADV. PG. 228.
Ⓥ FREED TRANSFORMER CO., INC., 1726 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 141.
Ⓥ Gates Radio Co., Quincy, Ill.
Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
Ⓥ HEATH CO., Benton Harbor, Mich. ADV. PG. 279.
Hose-McCann Telephone Co., Inc., 25th St. & 3rd Ave., Brooklyn 32, N. Y.
Jamaica Television Mfg. Co., 95-26 Sutphin Blvd., Jamaica 4, N. Y.
Ⓥ Langevin Mfg. Corp., 37 W. 65th St., New York 23, N. Y.
Ⓥ Lear, Inc., 110 Ionia Ave., N. W., Grand Rapids 2, Mich.
Ⓥ Lyman Electronic Corp., 13 Cass St., Springfield, Mass.
Ⓥ Minnesota Electronics Corp., 97 E. Fifth St., St. Paul 1, Minn.
Ⓥ McIntosh Engineering Laboratory, Inc., 910 King St., Silver Spring, Md.
Ⓥ Magna Electronics Co., 3707-11 W. Jefferson, Los Angeles 16, Calif.
Maguire Mfg. Div., Maguire Industries, Inc., Mt. Carmel, Ill.
Ⓥ Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.
Ⓥ Mulled Insulation Co., Aircraft Control Div., 335 E. Price St., Philadelphia, Pa.
Ⓥ Newcomb Audio Products Co., 6824 Lexington Ave., Hollywood 38, Calif.
Ⓥ Precision Electronics, 641 Milwaukee Ave., Chicago 22, Ill.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers
Radio Music Corp., Port Chester, N. Y.
Ⓥ Rauland-Borg Corp., 3523 W. Addison St., Chicago 18, Ill.
Ⓥ RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
Ⓥ Rembler Co., Ltd., 2101 Bryant St., San Francisco, Calif.
Ⓥ Rola & Jeffreys, Inc., 140 Glenridge Ave., Montclair, N. J.
Ⓥ Riley Co., Inc., P. O. Box 31, Middletown, Conn.
Ⓥ Schutting & Co., Inc., 9th & Kearney Sts. NE., Washington 17, D. C.
Ⓥ Scott, Inc., Herman Hosmer, 385 Putnum Ave., Cambridge 39, Mass.
Ⓥ Scott Radio Labs., Inc., 4451 N. Ravenswood Ave., Chicago 40, Ill.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ Singdon Mfg. Co., Inc., Mark, 32-28 49th St., Long Island City 3, N. Y.
Smuckler & Co., Inc., A. F., 202 Tillary St., Brooklyn 1, N. Y.
Ⓥ Stanell-Hoffman Corp., 1016 N. Highland Ave., Hollywood 38, Calif.
Ⓥ Thordarson Electric Mfg. Div., Maguire Industries, Inc., 500 W. Huron St., Chicago 10, Ill.
Ⓥ Transmitter Equipment Co., Inc., 345 Hudson St., New York 14, N. Y.
Universal Broadcast Equipment Corp., 6035 Northwest Highway, Chicago 31, Ill.
Ⓥ Vickers Electric Division, Vickers Inc., 1815 Locust St., St. Louis 3, Mo.
Ⓥ Webster Electric Co., 1900 Clark St., Racine, Wis.
Western Sound & Electric Labs., Inc., 805 S. 5th St., Milwaukee 4, Wis.

AMPLIFIERS—r-f

Ⓥ Air Associates, Inc., Teterboro, N. J.
American Communications Corp., 306 Broadway, New York 7, N. Y.
American Electroneering Co., 2112 S. LaBrea Ave., Los Angeles, Calif.
Ⓥ Automatic Mfg. Corp., 65 Gouverneur St., Newark 4, N. J.
Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.
Burnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ Collins Radio Co., Cedar Rapids, Iowa.
Darlton Labs., 6064 Santa Monica Blvd., Los Angeles, Calif.
Ⓥ Doolittle Radio, Inc., 7421 S. Loomis Blvd., Chicago 36, Ill.
Ⓥ ELECTRONIC MEASUREMENTS CO., Red Bank, N. J. ADV. PG. 139.
Ⓥ EL-TRONICS, INC., 2649 No. Howard St., Philadelphia 33, Pa. ADV. PG. 238.
Ⓥ FEDERAL TELEPHONE AND RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.
Ⓥ Ferris Instrument Co., 110 Cornelia St., Boonton, N. J.
Ⓥ Gates Radio Co., Quincy, Ill.
Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
Ⓥ HEWLETT-PACKARD CO., 395 Page Mill Rd., Palo Alto, Calif. ADV. PG. 68, 69.
Hose-McCann Telephone Co., Inc., 25th St. & 3rd Ave., Brooklyn 32, N. Y.
Ⓥ INDUSTRIAL ELECTRONICS, INC., 2457 Woodward Ave., Detroit 1, Mich. ADV. PG. 255.
Jerrold Electronics Corp., 121 N. Broad St., Philadelphia, Pa.
Ⓥ Kaar Engineering Co., 2995 Middlefield Rd., Palo Alto, Calif.
Ⓥ KAY ELECTRIC CO., 14 Maple Ave., Pine Brook, N. J. ADV. PG. 193.
Ⓥ Lear, Inc., 110 Ionia Ave., N.W., Grand Rapids 2, Mich.
Ⓥ Lyomar Engineers, Inc., 1721 Delaney St., Philadelphia 3, Pa.
Ⓥ Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.
Northeastern Engineering, Inc., Manchester, N. H.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Plastics & Electronics Co., 272 Northland Ave., Buffalo 8, N. Y.
Ⓥ Press Wireless Mfg. Co., Inc., Carnegie Rd., Hicksville 1, L. I., N. Y.
Ⓥ RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
Ⓥ Scott Radio Labs., Inc., 4451 N. Ravenswood Ave., Chicago 40, Ill.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Smuckler & Co., Inc., A. F., 202 Tillary St., Brooklyn 1, N. Y.
Ⓥ SPENCER-KENNEDY LABS., INC., 186 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 256.
Ⓥ TECHNICAL APPLIANCE CORP., Sherburne, N. Y. ADV. PG. 201.
Ⓥ Teletronics Laboratory, Inc., 352 Maple Ave., Westbury, L. I., N. Y.
Ⓥ Transmitter Equipment Co., Inc., 345 Hudson St., New York 14, N. Y.

AMPLIFIERS—Servo

Ⓥ Air Associates, Inc., Teterboro, N. J.
American Electroneering Co., 2112 S. LaBrea Ave., Los Angeles, Calif.
Arlington Electric Products Inc., 500 W. 52nd St., New York 19, N. Y.
Ⓥ ARMA CORP., 254 36th St., Brooklyn 32, N. Y. ADV. PG. 146.
Ⓥ Askania Regulator Co., 240 E. Ontario St., Chicago 11, Ill.
Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.
Burnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ Collins Radio Co., Cedar Rapids, Iowa.
Ⓥ Control Engineering Corp., 863 Washington St., Canton, Mass.
Ⓥ Elin Corp., College Point, Long Island, N. Y.
Ⓥ Electronic Associates, Inc., Long Branch, N. J.
FLADER, INC., FREDERIC, North Tonawanda, N. Y. ADV. PG. 240.
Ⓥ Gaveco Labs., Inc., 2 East End Ave., New York 21, N. Y.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
Jarvis Electronics Corp., 6058 W. Fullerton Ave., Chicago 39, Ill.
Ⓥ Lear, Inc., 110 Ionia Ave., N. W., Grand Rapids 2, Mich.
Local Electronics Corp., 794 E. 140th St., New York 54, N. Y.
Ⓥ MACDONALD CO., INC., W. S., 33 University Rd., Cambridge 38, Mass. ADV. PG. 216.
Ⓥ Magnetic Instrument Co., 82 W. Main St., West Orange, N. J.
Ⓥ Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Roberts Aves., Philadelphia 44, Pa.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Plastics & Electronics Co., 272 Northland Ave., Buffalo 8, N. Y.
Ⓥ Reeves Instrument Corp., 215 E. 91st St., New York, N. Y.
Ⓥ Sawyer Engineering, Crescent Blvd. at Drexel Ave., Pennsauken Township, Camden 11, N. J.
Ⓥ Servomechanisms, Inc., 142 Mineola Blvd., Mineola, N. Y.
Ⓥ SERVO-TEK PRODUCTS CO., 4 Godwin Ave., Paterson, N. J. ADV. PG. 187.
Sherron Electronics Co., 1601 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ Standard Electronics Research Corp., 2 East End Ave., New York 21, N. Y.
Ⓥ Transmitter Equipment Co., Inc., 345 Hudson St., New York 14, N. Y.
VECTRON, INC., 235 High St., Waltham, Mass. ADV. PG. 266.
Ⓥ Vickers Electric Division, Vickers Inc., 1815 Locust St., St. Louis 3, Mo.

AMPLIFIERS—Strain Gage

Ⓥ ALDEN PRODUCTS CO., 117 N. Main St., Brockton 64, Mass. ADV. PG. 235.
Ⓥ Applied Science Corp. of Princeton, The, P. O. Box 44, Princeton, N. J.
Ⓥ Baldwin Locomotive Works, Philadelphia 42, Pa.
Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ BRUSH DEVELOPMENT CO., 3406 Perkins Ave., Cleveland 14, Ohio. ADV. PG. 124, 125.
Burnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ CENTURY GEOPHYSICAL CORP., 1333 N. Utica, Tulsa 3, Okla. ADV. PG. 237.
Ⓥ Commercial Research Labs., Inc., 20 Bartlett Ave., Detroit 3, Mich.
Ⓥ Consolidated Engineering Corp., 620 N. Lake Ave., Pasadena 4, Calif.
Ⓥ Control Engineering Corp., 863 Washington St., Canton, Mass.
Ⓥ Kin Electronics Co., 207 Main St., Worcester, Mass.
Ⓥ ELECTRONIC TUBE CORP., 1200 E. Mermaid Ave., Philadelphia 18, Pa. ADV. PG. 156.
Engineering Lab., Inc., 602 E. 4th St., Tulsa 1, Okla.
Ⓥ Forest Electronics, 168 S. Jefferson St., Chicago 6, Ill.
Ⓥ Hanger Development, 401 E. 74th St., New York 21, N. Y.
Ⓥ Hathaway Instrument Co., 1315 S. Clarkson St., Denver 10, Colo.
Ⓥ HEILAND RESEARCH CORP., 150 E. 5th Ave., Denver 9, Colo. ADV. PG. 242.
Ⓥ INDUSTRIAL ELECTRONICS, INC., 2457 Woodward Ave., Detroit 1, Mich. ADV. PG. 255.

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Ⓥ MACDONALD CO. ★ S. 15 University Rd. Cambridge 38, Mass. ADV. PG. 218.
MacLeod & Hanson, 10 Joiner St. Charlestown 29, Mass.
Ⓥ Miller Corp., Wm., 562 W. Colorado St., Pasadena, Calif.
Ⓥ Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Roberts Aves., Philadelphia 44, Pa.
Ⓥ North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
Ⓥ Pfaff Electronics, Inc., 5120 N. Kedzie Ave. Chicago 25, Ill.
Process & Instruments, 40 Greenpoint Ave. Brooklyn 22, N. Y.
Ⓥ RAHM INSTRUMENTS, INC., 10 West Broadway, New York 7, N. Y. ADV. PG. 178
Ⓥ Rose de Forest, Inc., 76 Massachusetts Ave., Cambridge 39, Mass.
Ⓥ SANBORN CO., 39 Osborn St., Cambridge 39, Mass. ADV. PG. 219
Sherron Electronic Co., 2201 Flushing Ave. Brooklyn 6, N. Y.
Southwestern Industrial Electronic Co., 2631 Post Oak Rd., Houston 19, Texas.
Ⓥ Tech Laboratories, Inc., Bergen & Edsall Blvd., Palisades Park, N. J.
Ⓥ Trans-Sonics, Inc., Bedford Airport, Bedford, Mass.
VECTRON, INC., 235 High St., Waltham, Mass. ADV. PG. 244
Ⓥ Vickers Electric Division, Vickers Inc., 1815 Locust St., St. Louis 3, Mo.
Ⓥ WATERMAN PRODUCTS CO., 2440-64 Emerald St., Philadelphia 25, Pa. ADV. PG. 252

AMPLIFIERS—*Television*

American Communications Corp., 306 Broadway, New York 7, N. Y.
Ⓥ Bogen Co., Inc., David, 663 Broadway, New York 12, N. Y.
Ⓥ Clarke Instrument Corp., 910 King St., Silver Spring, Md.
Ⓥ ELECTRONIC MEASUREMENTS CO., Red Bank, N. J. ADV. PG. 139
Ⓥ ELECTRO VOICE, INC., Buchanan, Mich. ADV. PG. 207
Espey Mfg. Co., Inc., 528 E. 72nd St., New York, N. Y.
Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 9 to 18
Ⓥ HEWLETT-PACKARD CO., 395 Page Mill Rd., Palo Alto, Calif. ADV. PG. 68, 69
Ⓥ Intra-Video Corp. of America, 238 William St., New York 7, N. Y.
Ⓥ J. F. D. MFG. CO., 4102-14 Sixteenth Ave., Brooklyn, N. Y. ADV. PG. 254, 264
Jamaica Television Mfg. Co., 95-26 Sutphin Blvd., Jamaica 4, N. Y.
Ⓥ Lenkurt Electric Co., Inc., 1123 N. Rengstorff Ave., Mountain View, Calif.
Leonard Electric Products Co., Inc., 1434 Elmwood Ave., Buffalo 13, N. Y.
Ⓥ Magnavox Co., The, 1701 Defrees St., Fort Wayne 6, Ind.
M. B. Electronics, 1414 Fairfield St., Lincoln, Nebr.
Monroe Electronics, 1819 N. Narragansett Ave., Chicago 39, Ill.
Ⓥ Music Specialties Co., 1008-1021 W. Washington St., Bloomington, Ill.
Ⓥ Myers, Inc., Arlington Heights Airport, Arlington Heights, Ill.
Ⓥ NATIONAL CO., INC., 61 Sherman St., Malden 48, Mass. ADV. PG. 43 to 46
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Polarad Electronics Corp., 100 Metropolitan Ave., Brooklyn 11, N. Y.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., Central Offices, Camden, N. J. ADV. PG. 15 to 18
RCA Victor & Radio Equip., Inc., 1111 Chestnut St., Philadelphia 7, Pa.
Ⓥ RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257
Ⓥ REEVES-HOFFMAN CORP., 215 Cherry St., Carlisle, Pa. ADV. PG. 61
Sherron Electronics Co., 2201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ Simplex Mfg. Co., Inc., Mark, 32-38 Eagle St., Long Island City 1, N. Y.
Smucker & Co., Inc., A. F., 260 Pitney St., Bradford, Pa.
Ⓥ SPENCER-KENNEDY LABS., INC., 186 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 256
Ⓥ STANDARD COIL PRODUCTS CO., 2179 N. Pitcher Rd., Chicago 39, Ill. ADV. PG. 213
Ⓥ TECHNICAL APPLIANCE CORP., Sherburne, N. Y. ADV. PG. 205
Telechrome, Inc., 2467 W. Wisconsin, Chicago, Ill.
Ⓥ Television Equipment Corp., 238 William St., New York 7, N. Y.
Television Products, Inc., 3660 Dixie Way, Miami 32, Fla.
Ⓥ Tel-Instrument Co., Inc., 50 Paterson Ave., E. Rutherford, N. J.
Video Corp. of America, 270 W. 38th St., New York 18, N. Y.
West Coast Electronics Co., 1601 S. Burlington St., Los Angeles 6, Calif.

AMPLIFIERS—*Ultrasonic*

Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169
Ⓥ Crystal Research Labs., Inc., 29 Allyn St., Hartford, Conn.
Ⓥ Fox Corp., College Point, Long Island, N. Y.
Ⓥ ELECTRONIC MEASUREMENTS CO., Red Bank, N. J. ADV. PG. 139
Ⓥ FREED TRANSFORMER CO., INC., 1726 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 143
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 14
Ⓥ KEITHLEY INSTRUMENTS, 1509 Harvard-Lee Center Rd., Cleveland 21, Ohio. ADV. PG. 236
Ⓥ Milnor Engineering Laboratory, Inc., 910 King St., Silver Spring, Md.
Ⓥ Missa Laboratories, 1864 Carnegie St., Cleveland, Ohio.
Ⓥ Minnesota Electronics Corp., 47 E. 14th St., St. Paul 1, Minn.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Premier Crystal Labs., Inc., 79-89 Seventh Ave., New York 11, N. Y.
Ⓥ RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257
Ⓥ Rencor Co., Ltd., 2101 Bryant Ave., San Francisco, Calif.
Sherron Electronics Co., 2201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ SPENCER-KENNEDY LABS., INC., 186 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 256
Ⓥ Triplett & Barton, Inc., 811 N. Lake St., Burbank, Calif.

AMPLIFIERS—*Vibration Pickup*

Ⓥ Applied Science Corp. of Princeton, Inc., P. O. Box 44, Princeton, N. J.
Ⓥ CENTURY GEOPHYSICAL CORP., 1333 N. Utica, Tulsa 9, Oklahoma. ADV. PG. 237
Ⓥ Commercial Research Labs., Inc., 70 Bartlett Ave., Detroit 3, Mich.
Ⓥ Consolidated Engineering Corp., 620 N. Lake Ave., Pasadena, Calif.
Ⓥ EL TRONICS, INC., 2449 No. Howard St., Philadelphia 33, Pa. ADV. PG. 238
Ⓥ Kinsel Electronics, 104 S. Jefferson St., Chicago 6, Ill.
Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49
Ⓥ Hanover Developments, 401 E. 74th St., New York 21, N. Y.
Ⓥ Hathaway Instrument Co., 1315 S. Clarkson St., Denver 10, Colo.
Ⓥ HEILAND RESEARCH CORP., 130 E. 5th Ave., Denver, Colo. ADV. PG. 243
Ⓥ INDUSTRIAL ELECTRONICS, INC., 2457 Woodward Ave., Detroit 1, Mich. ADV. PG. 255
Ⓥ Kear, Inc., 310 Sutter Ave., N.W., Grand Rapids 2, Mich.
Ⓥ Missa Laboratories, 1868 Carnegie St., Cleveland, Ohio.
Ⓥ Murray Corp., Arlington Rd. & Colorado St., Pasadena, Calif.
Ⓥ Newcomb Audio Products Co., 6324 Lexington Ave., Hollywood 38, Calif.
Ⓥ North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
Ⓥ Pfaff Electronics, Inc., 5120 N. Kedzie Ave., Chicago 25, Ill.
Process & Instruments, 40 Greenpoint Ave., Brooklyn 22, N. Y.
Ⓥ RAHM INSTRUMENTS, INC., 10 W. Broadway, New York 7, N. Y. ADV. PG. 178
Ⓥ SANBORN CO., 39 Osborn St., Cambridge 39, Mass. ADV. PG. 219
Sherron Electronics Co., 2201 Flushing Ave., Brooklyn 6, N. Y.
Southwestern Industrial Electronic Co., 2631 Post Oak Rd., Houston 19, Texas.
Ⓥ SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 84, 85
Ⓥ Technology Instrument Corp., 1058 Main St., Waltham 54, Mass.
Ⓥ Theodore Electric Mfg. Div., Maguire Industries, Inc., 1600 Wilmington Pike, Chester, Pa.
Ⓥ WATERMAN PRODUCTS CO., INC., 2440-64 Emerald St., Philadelphia 25, Pa. ADV. PG. 252
Weston Electrical Instrument Corp., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 127
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77

AMPLIFIERS—*Wideband*

American Communications Corp., 306 Broadway, New York 7, N. Y.
Ⓥ ATOMIC INSTRUMENT CO., 160 Charles St., Boston, Mass. ADV. PG. 213
Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa.
Bruno & Co., 1 Pierrepont St., Brooklyn 2, N. Y.
Ⓥ CENTURY GEOPHYSICAL CORP., 1333 N. Utica, Tulsa 9, Oklahoma. ADV. PG. 237
Ⓥ ELECTRONIC MEASUREMENTS CO., Red Bank, N. J. ADV. PG. 139
Ⓥ EL TRONICS, INC., 2449 No. Howard St., Philadelphia 33, Pa. ADV. PG. 238
Ⓥ FREED TRANSFORMER CO., INC., 1726 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 143
Ⓥ Kinsel Electronics, 104 S. Jefferson St., Chicago 6, Ill.
Ⓥ Hanover Developments, 401 E. 74th St., New York 21, N. Y.
Ⓥ HEWLETT-PACKARD CO., 395 Page Mill Rd., Palo Alto, Calif. ADV. PG. 68, 69
Ⓥ INDUSTRIAL ELECTRONICS, INC., 2457 Woodward Ave., Detroit 1, Mich. ADV. PG. 255
Jamaica Television Mfg. Co., 95-26 Sutphin Blvd., Jamaica 4, N. Y.
Ⓥ Kaiser Labs, Inc., 1076 Morena Blvd., San Diego 10, Calif.
Ⓥ Kummer Engineers, Inc., 1721 Delaney St., Philadelphia 3, Pa.
Ⓥ Milnor Engineering Laboratory, Inc., 910 King St., Silver Spring, Md.
MacLeod & Hanson, 10 Joiner St., Charlestown 29, Mass.
Ⓥ Manufacturers Engr. & Equip. Corp., Willow Grove, Pa.
Network Mfg. Corp., Bayonne, N. J.
Ⓥ Newcomb Audio Products Co., 6824 Lexington Ave., Hollywood 38, Calif.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Phillips Petroleum Co., Special Products Div., Bartlesville, Okla.
Ⓥ Polarad Electronics Corp., 100 Metropolitan Ave., Brooklyn 11, N. Y.
Ⓥ Press Wireless Mfg. Co., Inc., Castleton Rd., Hicksville, L. I., N. Y.
Ⓥ Radiation Counter Laboratories, Inc., 1944 W. 21st St., Chicago 8, Ill.
Radio Music Corp., Port Chester, N. Y.
Ⓥ RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257
Ⓥ Rinehart & Co., Inc., 910 & Kearney Sts. N., Washington 17, D. C.
Sherron Electronics Co., 2201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ SPENCER-KENNEDY LABS., INC., 186 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 256
Ⓥ Standard Electronics Research Corp., 2 East End Ave., New York 21, N. Y.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, 63 Aldwych, London, W. C. 2, England.
Ⓥ Technology Instrument Corp., 1058 Main St., Waltham 54, Mass.
Ⓥ Tektronix, Inc., 712 S. E. Hawthorne Blvd., Portland 14, Ore.
Ⓥ Television Equipment Corp., 238 William St., New York 7, N. Y.
Ⓥ Tel-Instrument Co., Inc., 50 Paterson Ave., E. Rutherford, N. J.
Ⓥ Transvideo, Inc., 130 High St., Boston 10, Mass.
Ⓥ Video Electronics Co., 262 Canner St., New Haven 11, Conn.
Ⓥ WATERMAN PRODUCTS CO., INC., 2440-64 Emerald St., Philadelphia 25, Pa.

ANALYZERS—*Audio Amplifier*

Ⓥ Altec Lansing Corp., 161 Avenue of the Americas, New York 13, N. Y.
Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169
Cabinet Engineering & Electronics Co., 828 N. Highland Ave., Hollywood 38, Calif.
Coleytone Electronics Co., Inc., 130 Regency Ave., Los Angeles, Calif.
Ⓥ ELECTRONIC MEASUREMENTS CO., Red Bank, N. J. ADV. PG. 139
Fairchild Recording Equipment Corp., 154th St. & 7th Avenue, Whitestone, N. Y.
Ⓥ HEWLETT-PACKARD CO., 395 Page Mill Rd., Palo Alto, Calif. ADV. PG. 68, 69
Hickman Corp., C. L., 436 Blvd. of Allies, Pittsburgh, Pa.
Ⓥ KAY ELECTRIC CO., 14 Maple Ave., Pine Brook, N. J. ADV. PG. 193
McMurdo Silver Co., Inc., 1240 Main St., Hartford 3, Conn.
Ⓥ RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257
Rivers Co., Inc., P. O. Box 31, Middletown, Conn.
Sherron Electronics Co., 2201 Flushing Ave., Brooklyn 6, N. Y.
West Coast Electronics Co., 1601 S. Burlington St., Los Angeles 6, Calif.
Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 128

ANALYZERS—*Capacitor*

Ⓥ Cinch Manufacturing Co., 4212 N. Broadway, Chicago, Ill.
Ⓥ CORNELL-DUBILIER ELECTRIC CORP., South Plainfield, N. J. ADV. PG. 70
Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 9 to 18
Ⓥ HEATH CO., Benton Harbor, Mich. ADV. PG. 219
Ⓥ Jackson Electrical Instrument Co., In D. Patterson Blvd., Dayton 1, Ohio.
McMurdo Silver Co., Inc., 1240 Main St., Hartford 3, Conn.
Ⓥ MEASUREMENTS CORP., Boonton, N. J. ADV. PG. 145
Metropolitan Electronics & Instrument Co., 10e Fifth Ave., New York 11, N. Y.
Ⓥ Sprague Electric Co., North Adams, Mass.
Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 128

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ANALYZERS—*Circuit*

Bradley Laboratories, Inc., 145 Livingston St., Brooklyn 17, N. Y.

Ⓥ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.

Ⓥ Electric Heat Control Co., The, 9123 Inman Ave., Cleveland 5, Ohio.

Ⓥ Electronic Workshop, Inc., 391 Bleecker St., New York 14, N. Y.

Ⓥ Feller Engineering Co., 1651 S. Federal St., Chicago 16, Ill.

Ⓥ Jackson Electrical Instrument Co., 16 S. Patterson Blvd., Dayton 1, Ohio.

Ⓥ KAY ELECTRIC CO., 14 Maple Ave., Pine Brook, N. J. ADV. PG. 193.

Messner Mfg. Div., Maguire Industries, Inc., Mt. Carmel, Ill.

Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.

Precision Apparatus Co., Inc., 92-27 Horace Harding Blvd., Elmhurst, N. Y.

Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 75 to 76, Inside Back and Back Covers.

Ⓥ Simpson Electric Co., Div. American Gage & Machine Co., 5200 W. Kinzie St., Chicago 44, Ill.

Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

ANALYZERS—*Frequency*

Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.

Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.

Ⓥ KAY ELECTRIC CO., 14 Maple Ave., Pine Brook, N. J. ADV. PG. 193.

Ⓥ PANORAMIC RADIO PRODUCTS, INC., 10 South Second Ave., Mt. Vernon, N. Y. ADV. PG. 270.

Ⓥ POTTER INSTRUMENT CO., INC., 115 Cutter Mill Rd., Great Neck, N. Y. ADV. PG. 204.

Ⓥ Sheffield Instrument Corp., 2021 N. Lincoln St., Burbank, Calif.

Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

ANALYZERS—*Gas*

Ⓥ Applied Physics Corp., 30 W. Green St., Pasadena 1, Calif.

Ⓥ Bailey Meter Co., 1044 Ivanhoe Rd., Cleveland 10, Ohio.

Ⓥ Hazel Associates, Inc., 33 University Rd., Cambridge 38, Mass.

Ⓥ Baker & Co., Inc., 113 Astor St., Newark 5, N. J.

Ⓥ Consolidated Engineering Corp., 620 N. Lake Ave., Pasadena 4, Calif.

Ⓥ Electric Heat Control Co., The, 9123 Inman Ave., Cleveland 5, Ohio.

Ⓥ Gow-Mac Instrument Co., 22 Lawrence St., Newark 5, N. J.

Ⓥ Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.

Ⓥ National Technical Laboratories, 820 Mission St., South Pasadena, Calif.

Process & Instruments, 60 Greenpoint Ave., Brooklyn 22, N. Y.

Ⓥ R-Boom Co., 3751 Ridge Ave., Philadelphia, Pa.

Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

ANALYZERS—*Harmonic*

Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.

Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.

Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.

Ⓥ HEWLETT-PACKARD CO., 395 Page Mill Rd., Palo Alto, Calif. ADV. PG. 68, 69.

Ⓥ KAY ELECTRIC CO., 14 Maple Ave., Pine Brook, N. J. ADV. PG. 193.

Ⓥ Marconi Instruments, Ltd., 23 Beaver St., New York 4, N. Y.

Ⓥ MICO INSTRUMENT CO., 80 Trowbridge St., Cambridge 38, Mass. ADV. PG. 263.

Ⓥ MUIRHEAD & CO., LTD., Beckenham Kent-England. ADV. PG. 72.

Ⓥ PANORAMIC RADIO PRODUCTS, INC., 10 South Second Ave., Mt. Vernon, N. Y. ADV. PG. 270.

Ⓥ Scott, Inc., Hermon Hosmer, 385 Putnam Ave., Cambridge 39, Mass.

ANALYZERS—*Intermodulation*

Ⓥ Altec Lansing Corp., 161 Avenue of the Americas, New York 13, N. Y.

Ⓥ Audio Instrument Co., 1947 Broadway, New York 23, N. Y.

Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.

Ⓥ KAY ELECTRIC CO., 14 Maple Ave., Pine Brook, N. J. ADV. PG. 193.

Ⓥ MEASUREMENTS CORP., Boonton, N. J. ADV. PG. 145.

Ⓥ PANORAMIC RADIO PRODUCTS, INC., 10 South Second Ave., Mt. Vernon, N. Y. ADV. PG. 270.

Ⓥ PICKERING & CO., 309 Woods Ave., Oceanside, L. I., N. Y. ADV. PG. 244.

Ⓥ Scott, Inc., Hermon Hosmer, 385 Putnam Ave., Cambridge 39, Mass.

ANALYZERS—*Magnetic*

Ⓥ DuMont Labs., Inc., Allen B., 2 Main Ave., Passaic, N. J.

Ⓥ H.M.R. Electronics, Inc., Grove St., New Canaan, Conn.

Ⓥ SPERRY PRODUCTS, INC., Danbury, Conn. ADV. PG. 54.

ANALYZERS—*Microwave Radar*

Ⓥ Canoga Corp., 14315 Bessemer St., P. O. Box 361, Van Nuys, Calif.

Ⓥ KAY ELECTRIC CO., 14 Maple Ave., Pine Brook, N. J. ADV. PG. 193.

Ⓥ Manufacturers Thread Grinding Inc., P. O. Box 66, Eatontown, N. J.

Ⓥ Microwave Equipment Co., Inc., North Caldwell, N. J.

Ⓥ PANORAMIC RADIO PRODUCTS, INC., 10 South Second Ave., Mt. Vernon, N. Y. ADV. PG. 270.

Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.

Ⓥ POLYTECHNIC RESEARCH & DEVELOPMENT CO., INC., 202 Tillary St., Brooklyn 1, N. Y. ADV. PG. 56, 57.

Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.

Ⓥ SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.

Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

ANALYZERS—*Noise*

Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.

Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.

Ⓥ HEWLETT-PACKARD CO., 395 Page Mill Rd., Palo Alto, Calif. ADV. PG. 68, 69.

Ⓥ KAY ELECTRIC CO., 14 Maple Ave., Pine Brook, N. J. ADV. PG. 193.

Ⓥ MEASUREMENTS CORP., Boonton, N. J. ADV. PG. 145.

Ⓥ PANORAMIC RADIO PRODUCTS, INC., 10 South Second Ave., Mt. Vernon, N. Y. ADV. PG. 270.

Ⓥ Scott, Inc., Hermon Hosmer, 385 Putnam Ave., Cambridge 39, Mass.

ANALYZERS—*Servo*

Arlington Electric Products Inc., 500 W. 52nd St., New York 19, N. Y.

Ⓥ KROHN-HITE INSTRUMENT CO., 580 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 129.

Ⓥ Philbrick Researches, Inc., George A., 230 Congress St., Boston 10, Mass.

Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.

Ⓥ Reeves Instrument Corp., 215 E. 91st St., New York, N. Y.

Ⓥ SERVO CORP. OF AMERICA, 2020 Jericho Turnpike, New Hyde Park, N. Y. ADV. PG. 269.

Ⓥ Servomechanisms, Inc., 142 Mineola Blvd., Mineola, N. Y.

Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.

VECTRON, INC., 235 High St., Waltham, Mass. ADV. PG. 266.

ANALYZERS—*Spectrum*

Ⓥ Canoga Corp., 14315 Bessemer St., P. O. Box 361, Van Nuys, Calif.

Ⓥ Electronic Associates, Inc., Long Branch, N. J.

Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 15.

Ⓥ KAY ELECTRIC CO., 14 Maple Ave., Pine Brook, N. J. ADV. PG. 193.

Leru Laboratories, Inc., 360 Bleecker St., New York 14, N. Y.

Ⓥ National Technical Laboratories, 820 Mission St., South Pasadena, Calif.

Ⓥ PANORAMIC RADIO PRODUCTS, INC., 10 South Second Ave., Mt. Vernon, N. Y. ADV. PG. 270.

Ⓥ Perkin-Elmer Corp., The, Glenbrook, Conn.

Ⓥ Polarad Electronics Corp., 100 Metropolitan Ave., Brooklyn 11, N. Y.

Ⓥ POLYTECHNIC RESEARCH & DEVELOPMENT CO., INC., 202 Tillary St., Brooklyn 1, N. Y. ADV. PG. 56, 57.

Ⓥ VECTRON, INC., 235 High St., Waltham, Mass. ADV. PG. 266.

Western Electro-Acoustic Labs., 621 S. Spring St., Los Angeles 14, Calif.

Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

ANALYZERS—*Surface Analyzers & Comparators*

Ⓥ Baüsch & Lomb Optical Co., 635 St. Paul St., Rochester 2, N. Y.

Ⓥ BRUSH DEVELOPMENT CO., 3405 Perkins Ave., Cleveland 14, Ohio. ADV. PG. 124, 125.

Ⓥ Photron Instrument Co., 6516 Detroit Ave., Cleveland 2, Ohio.

Scherr Co., Inc., George, 200 Lafayette St., New York 12, N. Y.

ANALYZERS—*Ultrasonic*

Ⓥ PANORAMIC RADIO PRODUCTS, INC., 10 South Second Ave., Mt. Vernon, N. Y. ADV. PG. 270.

Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.

Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 615 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

ANALYZERS—*Vibration*

Ⓥ AIRCRAFT ELECTRONICS ASSOCIATES INC., 1031 New Britain Ave., Hartford 10, Conn. ADV. PG. 214.

Ⓥ Associated Research, Inc., 3758 W. Belmont, Chicago 18, Ill.

Ⓥ Calidyne Co., The, 751 Main St., Winchester, Mass.

Ⓥ Consolidated Engineering Corp., 620 N. Lake Ave., Pasadena 4, Calif.

Ⓥ Electro Products Labs., Inc., 549 W. Randolph St., Chicago 6, Ill.

Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.

Ⓥ KAY ELECTRIC CO., 14 Maple Ave., Pine Brook, N. J. ADV. PG. 193.

Ⓥ Miller Corp., Wm., 362 W. Colorado St., Pasadena, Calif.

Ⓥ PANORAMIC RADIO PRODUCTS, INC., 10 South Second Ave., Mt. Vernon, N. Y. ADV. PG. 270.

Sheffield Instrument Corp., 2021 N. Lincoln St., Burbank, Calif.

Ⓥ SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.

Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

ANALYZERS—*Video*

Ⓥ Back Video Corp., F. G., Room 2223, 500 Fifth Ave., New York, N. Y.

Ⓥ KAY ELECTRIC CO., 14 Maple Ave., Pine Brook, N. J. ADV. PG. 193.

ANALYZERS—*Wave*

Ⓥ ATOMIC INSTRUMENT CO., 160 Charles St., Boston, Mass. ADV. PG. 218.

Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.

Ⓥ Electrodyne Company, 32 Oliver St., Boston, Mass.

Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.

Ⓥ HEWLETT-PACKARD CO., 395 Page Mill Rd., Palo Alto, Calif. ADV. PG. 68, 69.

Ⓥ Marconi Instruments, Ltd., 23 Beaver St., New York 4, N. Y.

Ⓥ MUIRHEAD & CO., LTD., Beckenham Kent-England. ADV. PG. 72.

Ⓥ PANORAMIC RADIO PRODUCTS, INC., 10 South Second Ave., Mt. Vernon, N. Y. ADV. PG. 270.

Ⓥ Scott, Inc., Hermon Hosmer, 385 Putnam Ave., Cambridge 39, Mass.

ANCHORS—*Screw or Bolt*

Ⓥ Ackerman Johnson Co., 625 Jackson Blvd., Chicago 6, Ill.

Ⓥ Allmetal Screw Products Co., Inc., 33 Greene St., New York 13, N. Y.

Ⓥ Arro Expansion Bolt Co., Boone Ave., Marion, Ohio.

Ⓥ Chicago Expansion Bolt Co., 1338 W. Concord Place, Chicago 22, Ill.

Eastern Metals Industries, 250 W. 54th St., New York 19, N. Y.

Ⓥ Electronic Indicator Corp., 53 Wyckoff St., Brooklyn, N. Y.

Ⓥ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.

Ⓥ INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.

Ⓥ J F D MFG. CO., 6101-23 Sixteenth Ave., Brooklyn, N. Y. ADV. PG. 254, 264.

Ⓥ Locke Incorporated, P. O. Box 57, Baltimore 3, Md.

Ⓥ National Screw & Mfg. Co., Cleveland 4, Ohio.

Prestole Corp., 3119 Bellevue Rd., Toledo 6, Ohio.

Ⓥ Star Expansion Products Co., 147-149 Cedar St., New York 6, N. Y.

ANTENNA DRAG UNITS

Ⓥ Aeronautical Radio Mfg. Co., 155 First St., Mineola, N. Y.

Ⓥ Lear, Inc., 110 Ionia Ave., NW., Grand Rapids 2, Mich.

Ⓥ Mitchell Industries, Inc., Camp Wolters, Mineral Wells, Texas.

Ⓥ Indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

ANTENNA FAIRLEADS

Ⓥ Aeronautical Radio Mfg. Co., 155 First St., Mineola, N. Y.
Ⓥ Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.
National Electrical Machine Shops, Inc., 919 Jesup-Blair Drive, Silver Spring, Md.
Telephonics Corp., Park Ave., Huntington, N. Y.

ANTENNA FEED SYSTEMS

Ⓥ Air Associates, Inc., Teterboro, N. J.
Ⓥ American Communications Corp., 306 Broadway, New York 7, N. Y.
Ⓥ Andrew Corp., 363 E. 75th St., Chicago 19, Ill.
Ⓥ Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ Collins Radio Co., Cedar Rapids, Iowa.
Ⓥ Communication Products Co., Inc., 100 Broadway & Clark St., Keyport, N. J.
Ⓥ J. F. D. MFG. CO., 4101-23 Sixteenth Ave., Brooklyn, N. Y., ADV. PG. 254, 264
Ⓥ Johnson Co., E. F., Waseca, Minn.
Ⓥ Lyman Engineers, Inc., 1721 Delaware St., Philadelphia 3, Pa.
Ⓥ Mitchell Industries, Inc., Camp Wolters, Mineral Wells, Texas.
Ⓥ Narwark Mfg. Corp., Bayonne, N. J.
Ⓥ Press Wireless Mfg. Co., Inc., Carnegie Rd., Hicksville, L. I., N. Y.
Ⓥ Product Development Co., Inc., Arlington, N. J.
Ⓥ RAYTHEON MFG. CO., Power Tube Div., Waltham 54, Mass., ADV. PG. 257
Ⓥ REEVES-HOFFMAN CORP., 321 Cherry St., Carlisle, Pa., ADV. PG. 77
Ⓥ Technical Material Corp., The, 453 W. 47th St., New York 19, N. Y.
Ⓥ Ward Products Corp., Div. of The Gabriel Co., 1523 E. 45th St., Cleveland 3, Ohio.
Ⓥ West Tuscarora Co., Tower & Antenna Div., E. Market St. & Penna. R. R., West Chester, Pa.

ANTENNA KITS

Ⓥ Aeronautical Radio Mfg. Co., 155 First St., Mineola, N. Y.
Ⓥ Alpha Wire Corp., 50 Howard St., New York, N. Y.
Ⓥ American Communications Corp., 306 Broadway, New York 7, N. Y.
American Electroneering Co., 2112 E. LaBrea Ave., Los Angeles, Calif.
Ⓥ AMERICAN PHENOLIC CORPORATION, 1830 S. 54th Ave., Chicago 50, Ill., ADV. PG. 191
Ⓥ Andrew Corp., 363 E. 75th St., Chicago 19, Ill.
Ⓥ Belden Mfg. Co., 4647 W. Van Buren St., Chicago 44, Ill.
Ⓥ Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.
Birnbach Radio Co., Inc., 145 Hudson St., New York, N. Y.
Ⓥ Brach Mfg. Corp., 200 Central Ave., Newark 4, N. J.
Ⓥ Channel Master Co., Ellenville, N. Y.
Ⓥ Collins Radio Co., Cedar Rapids, Iowa.
Ⓥ Columbia Wire & Supply Co., 2918 Ninth Park Rd., Chicago 18, Ill.
Ⓥ Consolidated Wire & Associated Companies, 1638 S. Clinton St., Chicago 16, Ill.
Ⓥ CORNELL-DUBILIER ELECTRIC CORP., South Plainfield, N. J., ADV. PG. 70
Ⓥ Electronic Industrial Corp., 113 Wyckoff St., Hoboken, N. J., ADV. PG. 247
Ⓥ FLADER, INC., FREDERIC, North Tonawanda, N. Y., ADV. PG. 247
Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y., ADV. PG. 4 to 15
Ⓥ Gordon Specialties Co., 836-38 North Ave., Chicago 22, Ill.
Hallicrafters, Hyde Park Blvd. at Wentworth Ave., Chicago 16, Ill.
Ⓥ Hallicrafters, Hyde Park Blvd. at Wentworth Ave., Chicago 16, Ill.
Hallicrafters Co., The, 5th and Washington Ave., Rockford, Ill.
Ⓥ Hallicrafters Co., The, 5th and Washington Ave., Rockford, Ill.
Ⓥ INSULINE CORP. OF AMERICA, 30-30 47th Ave., Long Island City, N. Y., ADV. PG. 236, 247
Ⓥ J. F. D. MFG. CO., 4101-23 Sixteenth Ave., Brooklyn, N. Y., ADV. PG. 254, 264
Ⓥ Johnson Co., E. F., Waseca, Minn.
Ⓥ Locke Incorporated, P. O. Box 67, Baltimore 3, Md.
Ⓥ Mitchell Industries, Inc., Camp Wolters, Mineral Wells, Texas.
Ⓥ Narwark Mfg. Corp., Bayonne, N. J.
Ⓥ New Hope Products Mfg. Co., 21 Video Television Inc., 458 E. 167th St., New York 56, N. Y.
Ⓥ Phillips Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Philmore Mfg. Co., 113 University Place, New York 3, N. Y.
Ⓥ Premax Products, Div., Chisholm-Ryder Co., Inc., Niagara Falls 2, N. Y.
Ⓥ Product Development Co., Inc., Arlington, N. J.
Ⓥ RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass., ADV. PG. 257
Ⓥ Sun Co., Inc., Herman H., 435-445 St., Brooklyn 20, N. Y.
Ⓥ Utah Engineering & Mfg. Co., 3905 S. Grand Ave., Los Angeles 37, Calif.
Ⓥ TECHNICAL APPLIANCE CORP., Sherburne, N. Y., ADV. PG. 201
Technical Material Corp., The, 453 W. 47th St., New York 19, N. Y.
Ⓥ Transvision Inc., 460 North Ave., New Rochelle, N. Y.
Ⓥ Triplett Products Co., 1535 N. Ashland Ave., Chicago 22, Ill.
Ⓥ U. H. F. Resonator Co., 224 Seventh St., Racine, Wis.
Viker Corp., 7300 Huron River Drive, Dexter, Mich.
Ⓥ Ward Products Corp., Div. of the Gabriel Co., 1523 E. 45th St., Cleveland 3, Ohio.
Ⓥ Wind Turbine Co., Tower & Antenna Div., E. Market St. & Penna. R. R., West Chester, Pa.
Ⓥ Workshop Associates, Inc., 66 Needham St., Newton Highlands 61, Mass.

ANTENNA PEDESTALS—*Gear Driven Radar*

Ⓥ Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.
Ⓥ BREEZE CORPS., INC., 41 S. Sixth St., Newark 7, N. J., ADV. PG. 93
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ Canadian Marconi Co., 388-398 Wellington St., Montreal, Canada.
Ⓥ Canadian Marconi Co., 388-398 Wellington St., Halifax, N. S., Canada.
Ⓥ Electronic Associates, Inc., Long Branch, N. J.
Ⓥ Hyde Brothers Gear & Machine Corp., 4545 S. Western Blvd., Chicago 9, Ill.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y., ADV. PG. 4 to 15
Ⓥ RAYTHEON MFG. CO., Power Tube Div., Waltham 54, Mass., ADV. PG. 257
Ⓥ Robinette Co., W. C., 800 Fair Oaks Ave., South Pasadena, Calif.
Ⓥ Sperry Corp., 202 E. 44th St., New York 17, N. Y.
Ⓥ Submarine Signal Div., Raytheon Mfg. Co., Waltham, Mass.
VECTRON, INC., 235 High St., Waltham, Mass., ADV. PG. 266
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa., ADV. PG. 77

ANTENNA REELS

Ⓥ Aeronautical Radio Mfg. Co., 155 First St., Mineola, N. Y.
Ⓥ Air Associates, Inc., Teterboro, N. J.
Ⓥ Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.
Ⓥ Lear, Inc., 110 Ionia Ave., NW., Grand Rapids 2, Mich.
Ⓥ Mitchell Industries, Inc., Camp Wolters, Mineral Wells, Texas.
National Electrical Machine Shops, Inc., 919 Jesup-Blair Drive, Silver Spring, Md.

ANTENNA REFLECTORS—*Radar Parabolic*

Ⓥ Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ Collins Radio Co., Cedar Rapids, Iowa.
Ⓥ Canadian Marconi Co., 388-398 Wellington St., Halifax, N. S., Canada.
Ⓥ Electronic Associates, Inc., Long Branch, N. J.
Ⓥ Lockheed Aircraft Corp., Burbank, Calif.
Ⓥ Lyman Engineers, Inc., 1721 Delaware St., Philadelphia 3, Pa.
Ⓥ Lyon Mfg. Co., The, 16 Arbor St., Hartford, Conn.
Ⓥ M. T. E. CIRCUIT BREAKER CO., 19th & Hamilton Sts., Philadelphia 30, Pa., ADV. PG. 40, 41
Kennedy & Co., D. S., Cohasset, Mass.
Kent Co., F. C., 64-72 Howard St., Irvington, N. J.
Ⓥ MULTI METAL WIRE CLOTH CO., INC., 114th Garrison Ave., New York 59, N. Y., ADV. PG. 66
Narwark Mfg. Corp., Bayonne, N. J.
Ⓥ Press Wireless Mfg. Co., Inc., Carnegie Rd., Hicksville, L. I., N. Y.
Ⓥ Product Development Co., Inc., Arlington, N. J.
Ⓥ Radio Electric Co., 52 E. 19th St., New York 3, N. Y.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J., ADV. PG. 74 to 75, Inside Back and Back Covers
Ⓥ RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass., ADV. PG. 257
Ⓥ RCA Mfg. Corp., Jericho Turnpike, Mineola, N. Y.
Ⓥ Sensitive Industries, Inc., 401 E. 134th St., New York 54, N. Y.
Ⓥ SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y., ADV. PG. 85, 86
Ⓥ Submarine Signal Div., Raytheon Mfg. Co., Waltham, Mass.
Tower Engineering Corp., 315 Madison St., Malden 48, Mass.
VECTRON, INC., 235 High St., Waltham, Mass., ADV. PG. 266
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa., ADV. PG. 77
Ⓥ Workshop Associates, Inc., 66 Needham Street, Newton Highlands 61, Mass.

ANTENNA ROTATORS

Ⓥ Alliance Manufacturing Co., Lake Park Blvd., Alliance, O.
Ⓥ Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.
Collins Radio Co., Cedar Rapids, Iowa.
Ⓥ CORNELL-DUBILIER ELECTRIC CORP., South Plainfield, N. J., ADV. PG. 70
Ⓥ Gordon Specialties Co., 836 W. North Ave., Chicago 22, Ill.
Ⓥ Hyde Brothers, Plainfield, N. J.
Ⓥ Johnson Co., E. F., Waseca, Minn.
Ⓥ Premax Products Div., Chisholm-Ryder Co., Inc., Niagara Falls 2, N. Y.
Ⓥ Radiart Corp., The, 3571 W. 62nd St., Cleveland, Ohio.
Ⓥ RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass., ADV. PG. 257
VECTRON, INC., 235 High St., Waltham, Mass., ADV. PG. 266

ANTENNA TOWERS & SUPPORTS

Ⓥ Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.
Ⓥ Blaw-Knox Co., Farmers Bank Bldg., Pittsburgh, Pa.
Ⓥ Bud Radio, Inc., 2118 E. 55th St., Cleveland 3, Ohio.
Ⓥ Kinsley Tower Co., 3600 Kinsley Ave., Racine, Wis.
Ⓥ Electronic Indicator Corp., 53 Wyckoff St., Brooklyn, N. Y.
Ⓥ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill., ADV. PG. 271
Gunset Co., 72 E. Tuunga Ave., Burbank, Calif.
Ⓥ International Service & Equipment Co., 875 Michigan Ave., Columbus 8, Ohio.
Ⓥ J. F. D. MFG. CO., 4101-23 Sixteenth Ave., Brooklyn, N. Y., ADV. PG. 254, 264
Ⓥ Los Nunez Processing Corp., Unionville, Conn.
Ⓥ Lundy Structural Steel Co., 17 Battery Pl., New York 4, N. Y.
Ⓥ Lyon & Son, Inc., John E., 28th St. & Bureen, Camden, N. J.
Ⓥ Pole Incorporated, P. O. Box 47, Baltimore 3, Md.
Ⓥ Press Wireless Mfg. Co., Inc., Carnegie Rd., Hicksville, L. I., N. Y.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J., ADV. PG. 73 to 75, Inside Back and Back Covers
Ⓥ RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass., ADV. PG. 257
Ⓥ RCA Mfg. Corp., Jericho Turnpike, Mineola, N. Y.
Ⓥ Rohn Mfg. Corp., 4444 S. 52nd St., New York 17, N. Y.
Sector Industries, Inc., 401 E. 134th St., New York 54, N. Y.
Ⓥ TRUSCON STEEL CO., Youngstown, Ohio, ADV. PG. 273
Ⓥ Winkelbarger Corp., E. 7th & Division Sts., Sioux City, Iowa.
Ⓥ Wind Turbine Co., Tower & Antenna Div., E. Market St. & Penna. R. R., West Chester, Pa.

ANTENNA TUNING UNITS

Ⓥ Aeronautical Communications Equipment, Inc., 3090 Mercer, Ft. Myers, Fla.
Ⓥ Andrew Corp., 363 E. 75th St., Chicago 19, Ill.
American Electroneering Co., 2112 LaBrea Ave., Los Angeles, Calif.
Ⓥ BARKER & WILLIAMSON, 236 Fairfield Ave., Upper Darby, Pa., ADV. PG. 183
Ⓥ Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ C. P. Winders, Inc., 61 Bergen St., Brooklyn 2, N. Y.
Ⓥ Collins Radio Co., Cedar Rapids, Iowa.
Ⓥ Eco Radio Labs., Inc., F. Stewart Ave., Garden City, N. Y.
Ⓥ FEDERAL TELEPHONE AND RADIO CORP., 100 Kingsland Rd., Clifton, N. J., ADV. PG. 23 to 28
Ⓥ Hallicrafters Co., The, 5th and Washington Ave., Rockford, Ill.
Ⓥ Hallicrafters, Hyde Park Blvd. at Wentworth Ave., Chicago, Ill.
Ⓥ Hytron Radio & Electronics Corp., Salem, Mass.
Ⓥ Johnson Co., E. F., Waseca, Minn.
Ⓥ Kent Co., F. C., 64-72 Howard St., Irvington, N. J.
Ⓥ Kurz-Kasch Inc., 1421 Eagle St., Dayton, O.
Ⓥ Lenz Electric Mfg. Co., Inc., 851 Lexington Ave., Brooklyn 21, N. Y.
Ⓥ Locke Incorporated, P. O. Box 67, Baltimore 3, Md.
Ⓥ Narwark Mfg. Corp., Bayonne, N. J.
Ⓥ NORTHERN RADIO CO., 143-145 W. 22nd St., New York 11, N. Y., ADV. PG. 132, 133
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J., ADV. PG. 73 to 75, Inside Back and Back Covers
Ⓥ REEVES-HOFFMAN CORP., 321 Cherry St., Carlisle, Pa., ADV. PG. 77
Ⓥ Transmitter Equipment Co., Inc., 145 Hudson St., New York 14, N. Y.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa., ADV. PG. 77

ANTENNAS—*Airborne Radar Spinner*

Ⓥ Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.
Ⓥ Brach Mfg. Corp., 200 Central Ave., Newark 4, N. J.
Ⓥ Canoga Corp., 14315 Bessemer St., P. O. Box 361, Van Nuys, Calif.
Ⓥ Gotham Co., Bronze Div., Providence 7, R. I.
Ⓥ Phillips Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass., ADV. PG. 257
VECTRON, INC., 235 High St., Waltham, Mass., ADV. PG. 266

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Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Ⓥ Workshop Associates, Inc., 66 Needham St., Newton Highlands 61, Mass.

ANTENNAS—*Aircraft Type*

Ⓥ Aeronautical Radio Mfg. Co., 155 First St., Mineola, N. Y.
Ⓥ Air Associates, Inc., Teterboro, N. J.
Ⓥ Airborne Instruments Lab., Inc., 160 Old Country Rd., Mineola, N. Y.
Ⓥ AIRCRAFT RADIO CORP., Boonton, N. J. ADV. PG. 198, 199.
American Electroneering Co., 2112 S. LaBrea Ave., Los Angeles, Calif.
Ⓥ AMERICAN PHENOLIC CORPORATION, 1830 S. 54th Ave., Chicago 50, Ill. ADV. PG. 191.
Ⓥ Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.
Ⓥ BIRD ELECTRONIC CORP., 1800 E. 38th St., Cleveland 14, Ohio. ADV. PG. 184, 185.
Ⓥ Brach Mfg. Corp., 200 Central Ave., Newark 4, N. J.
Ⓥ Collins Radio Co., Cedar Rapids, Iowa.
Ⓥ FLADER, INC., FREDERIC, North Tonawanda, N. Y. ADV. PG. 240.
Ⓥ INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
Ⓥ Lear, Inc., 110 Ionia Ave., N.W., Grand Rapids 2, Mich.
Ⓥ Mitchell Industries, Inc., Camp Wolters, Mineral Wells, Texas.
Ⓥ Premax Products Div., Chisholm-Ryder Co., Inc., Niagara Falls 2, N. Y.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
Selector Industries, Inc., 401 E. 138th St., New York 54, N. Y.
Ⓥ SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.
Ⓥ Triangle Products Co., 1535 N. Ashland Ave., Chicago 22, Ill.
Ⓥ Ward Products Corp., Div. of the Gabriel Co., 1523 E. 45th St., Cleveland 3, Ohio.
Ⓥ Warren Mfg. Co., Inc., 250 East St., New Haven, Conn.
Ⓥ Workshop Associates, Inc., 66 Needham St., Newton Highlands 61, Mass.

ANTENNAS—*All Wave Receiving*

Ⓥ American Communications Corp., 306 Broadway, New York 7, N. Y.
Ⓥ Amy, Aceves & King, Inc., 11 W. 42nd St., New York 18, N. Y.
Ⓥ Brach Mfg. Corp., 200 Central Ave., Newark 4, N. J.
Ⓥ Brunswick, Inc., 32-40 57th St., Woodside, N. Y.
Ⓥ Consolidated Wire & Associated Companies, 1635 S. Clinton St., Chicago 16, Ill.
Ⓥ CORNELL-DUBILIER ELECTRIC CORP., South Plainfield, N. J. ADV. PG. 70.
Ⓥ Electronic Indicator Corp., 53 Wyckoff St., Brooklyn, N. Y.
Ⓥ Hy-Lite Antennae Inc., 1060 Washington Ave., Bronx 56, N. Y.
Ⓥ INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Radiart Corp., 3571 W. 62nd St., Cleveland, Ohio.
Ⓥ RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
Ⓥ Scott Radio Labs., Inc., 4451 N. Ravenswood Ave., Chicago 40, Ill.
Ⓥ TECHNICAL APPLIANCE CORP., Sherburne, N. Y. ADV. PG. 201.
Ⓥ W. H. F. Resonator Co., 224 Seventh St., Racine, Wis.
Ⓥ Ward Products Corp., Div. of the Gabriel Co., 1523 E. 45th St., Cleveland 3, Ohio.
Ⓥ West Turbine Co., Tower & Antenna Div., E. Market St. & Penna. R. R., West Chester, Pa.

ANTENNAS—*Auto*

Ⓥ Brach Mfg. Corp., 200 Central Ave., Newark 4, N. J.
Ⓥ Buggie & Co., H. H., 726 Stanton St., Toledo, Ohio.
Ⓥ Brunswick, Inc., 32-40 57th St., Woodside, N. Y.
Ⓥ CORNELL-DUBILIER ELECTRIC CORP., South Plainfield, N. J. ADV. PG. 70.
Ⓥ Electronic Products Co., Inc., 125 Virginia Ave., Jersey City 5, N. J.
Ⓥ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
Ⓥ INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
Ⓥ J. F. D. MFG. CO., 6101-23 Sixteenth Ave., Brooklyn, N. Y. ADV. PG. 254, 264.
Ⓥ Kaar Engineering Co., 2995 Middlefield Rd., Palo Alto, Calif.
La Magna Mfg. Co., Inc., East Rutherford, N. J.
National Electronic Mfg. Corp., 35-05 36th St., Long Island City 5, N. Y.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Philson Mfg. Co., Inc., 60-66 Sackett St., Brooklyn 31, N. Y.
Ⓥ Premax Products Div., Chisholm-Ryder Co., Inc., Niagara Falls 2, N. Y.
Ⓥ Rad-El-Co Mfg. Co., 7580 Garfield Blvd., Cleveland 25, Ohio.
Ⓥ Radiart Corp., The, 3571 W. 62nd St., Cleveland 2, Ohio.
Ⓥ RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
Ⓥ Special Products Co., 9115 Brookville Rd., P. O. Box 471, Silver Spring, Md.
Vokar Corp., 7300 Huron River Drive, Dexter, Mich.
Ⓥ Ward Products Corp., Div. of The Gabriel Co., 1523 E. 45th St., Cleveland 3, Ohio.
West Coast Electronics Co., 1601 S. Burlington St., Los Angeles 6, Calif.

ANTENNAS—*Broadcast Station Radiators*

Ⓥ Collins Radio Co., Cedar Rapids, Iowa.
Ⓥ Hy-Lite Antennae Inc., 1060 Washington Ave., Bronx 56, N. Y.
Ⓥ Lehigh Structural Steel Co., 17 Battery Pl., N. Y. 4, N. Y.
Ⓥ Lings & Son, Inc., John E., 28th St., & Buren, Camden, N. J.
Ⓥ Press Wireless Mfg. Co., Inc., Cantiague Rd., Hicksville, L. I., N. Y.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
Ⓥ Radio Engineering Labs., Inc., 36-40 37th St., Long Island City, N. Y.
Ⓥ RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
West Coast Electronics Co., 1601 S. Burlington St., Los Angeles 6, Calif.
Ⓥ Winchester Corp., E. 7th & Division Sts., Sioux City, Iowa.
Ⓥ Wind Turbine Co., Tower & Antenna Div., E. Market St. & Penna. R. R., West Chester, Pa.
Ⓥ Workshop Associates, Inc., 66 Needham St., Newton Highlands 61, Mass.

ANTENNAS—*Directional Antenna Coupling & Phasing Units*

Ⓥ Air Associates, Inc., Teterboro, N. J.
Ⓥ AMERICAN PHENOLIC CORPORATION, 1830 S. 54th Ave., Chicago 50, Ill. ADV. PG. 191.
Ⓥ Andrew Corp., 363 E. 75th St., Chicago 19, Ill.
Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ Collins Radio Co., Cedar Rapids, Iowa.
Continental Electronics Mfg. Co., 1728 Wood St., Dallas 1, Texas.
Ⓥ FEDERAL TELEPHONE AND RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.
Ⓥ Gates Radio Co., Quincy, Ill.
Ⓥ Hy-Lite Antennae Inc., 1060 Washington Ave., Bronx 56, N. Y.
Ⓥ Jansen Co., E. F., Waseca, Minn.
Ⓥ Kings Electronics Co., Inc., 811 Lexington Ave., Brooklyn 21, N. Y.
Ⓥ Lear, Inc., 110 Ionia Ave., NW., Grand Rapids 2, Mich.
Ⓥ Network Mfg. Corp., Bayonne, N. J.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
Ⓥ RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
Ⓥ REEVES-HOFFMAN CORP., 321 Cherry St., Carlisle, Pa. ADV. PG. 32.
Selector Industries, Inc., 401 E. 138th St., New York 54, N. Y.
Ⓥ SPERRY GYROSCOPE CO., Div. of the Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.
Ⓥ Ward Products Corp., Div. of The Gabriel Co., 1523 E. 45th St., Cleveland 3, Ohio.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Ⓥ Wind Turbine Co., Tower & Antenna Div., E. Market St. & Penna. R. R., West Chester, Pa.
Ⓥ Workshop Associates, Inc., 66 Needham Street, Newton Highlands 61, Mass.

ANTENNAS—*Dummy Loads*

Ⓥ Aeronautical Communications Equipment, Inc., 3090 Davie Rd., Miami 34, Fla.
Ⓥ BIRD ELECTRONIC CORP., 1800 E. 38th St., Cleveland 14, Ohio. ADV. PG. 184, 185.
Bunnell-Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Coto-Coil Winders Inc., 61 Bevier St., Brooklyn 2, N. Y.
Continental Electronics Mfg. Co., 1728 Wood St., Dallas 1, Texas.
Ⓥ FEDERAL TELEPHONE & RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.
Ⓥ Gates Radio Co., Quincy, Ill.
Ⓥ Jansen Co., Broome Div., Pesaidence 7, P. I.
Ⓥ JONES ELECTRONICS CO., M. C., Bristol, Conn. ADV. PG. 138.
Lapp Insulator Co., Inc., 31 Gilbert St., Le Roy, N. Y.
Ⓥ Network Mfg. Corp., Bayonne, N. J.
Ⓥ OHMITE MFG. CO., 4835 W. Flournoy St., Chicago 44, Ill. ADV. PG. 83.
Ⓥ Press Wireless Mfg. Co., Inc., Cantiague Rd., Hicksville, L. I., N. Y.
Ⓥ Product Development Co., Inc., Arlington, N. J.
Selector Industries, Inc., 401 E. 138th St., New York 54, N. Y.
Ⓥ SHALLCROSS MFG. CO., 10 Jackson Ave., Collingdale, Pa. ADV. PG. 221.
Ⓥ SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.

ANTENNAS—*f-m Receiver*

Ⓥ AMERICAN PHENOLIC CORPORATION, 1830 S. 54th Ave., Chicago 50, Ill. ADV. PG. 191.
Ⓥ Amy, Aceves & King, Inc., 11 W. 42nd St., New York 18, N. Y.
Ⓥ Belden Mfg. Co., 4647 W. Van Buren St., Chicago 44, Ill.
Ⓥ Brach Mfg. Corp., 200 Central Ave., Newark 4, N. J.
Ⓥ Camburn, Inc., 32-40 57th St., Woodside, N. Y.
Ⓥ Carnine & Bitter, 2332 Ontario Rd., NW., Washington 9, D. C.
Ⓥ Communications Co., Inc., 300 Greco Ave., Coral Gables 34, Fla.
Ⓥ CORNELL-DUBILIER ELECTRIC CORP., South Plainfield, N. J. ADV. PG. 70.
Ⓥ Dielectric Products Co., Inc., 125 Virginia Ave., Jersey City 5, N. J.
Ⓥ Electronic Indicator Corp., 53 Wyckoff St., Brooklyn, N. Y.
Ⓥ HARVEY RADIO LABS., INC., 447 Concord Ave., Cambridge, Mass. ADV. PG. 104.
Ⓥ Hi-Par Products Co., Fitchburg, Mass.
Ⓥ Hy-Lite Antennae Inc., 1060 Washington Ave., Bronx 56, N. Y.
Ⓥ J. F. D. MFG. CO., 6101-23 Sixteenth Ave., Brooklyn, N. Y. ADV. PG. 254, 264.
La Magna Mfg. Co., Inc., East Rutherford, N. J.
Ⓥ LaPointe-Plascomold Corp., Unionville, Conn.
Ⓥ Network Mfg. Corp., Bayonne, N. J.
Ⓥ Oak Ridge Products Mfg. Div. of Video Television, Inc., 214 E. 127th St., New York 35, N. Y.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Philson Mfg. Co., Inc., 60-66 Sackett St., Brooklyn 31, N. Y.
Ⓥ Premax Products Div., Chisholm-Ryder Co., Inc., Niagara Falls 2, N. Y.
Ⓥ Rad-El-Co Mfg. Co., 7580 Garfield Blvd., Cleveland 25, Ohio.
Ⓥ RADIO CORP OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
Ⓥ Schuttig & Co., Inc., 9th & Kearney Sts., NE., Washington 17, D. C.
Ⓥ TECHNICAL APPLIANCE CORP., Sherburne, N. Y. ADV. PG. 201.
Ⓥ Telrex, Inc., Box 879, Rutherford & Neptune Highways, Asbury Park, N. J.
Ⓥ Triangle Products Co., 1535 N. Ashland Ave., Chicago 22, Ill.
Ⓥ W. H. F. Resonator Co., 224 Seventh St., Racine, Wis.
Vokar Corp., 7300 Huron River Drive, Dexter, Mich.
Ⓥ Ward Products Corp., Div. of The Gabriel Co., 1523 E. 45th St., Cleveland 3, Ohio.
Warren Mfg. Co., Inc., 250 East St., New Haven, Conn.
West Coast Electronics Co., 1601 S. Burlington St., Los Angeles 6, Calif.
Ⓥ Wind Turbine Co., Tower & Antenna Div., E. Market St. & Penna. R. R., West Chester, Pa.
Ⓥ Workshop Associates, Inc., 66 Needham St., Newton Highlands 61, Mass.

ANTENNAS—*f-m Transmitter*

Ⓥ Andrew Corp., 363 E. 75th St., Chicago 19, Ill.
Ⓥ Collins Radio Co., Cedar Rapids, Iowa.
Ⓥ Communications Co., Inc., 300 Greco Ave., Coral Gables 34, Fla.
Ⓥ FEDERAL TELEPHONE & RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.
Ⓥ Hy-Lite Antennae Inc., 1060 Washington Ave., Bronx 56, N. Y.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
Ⓥ Radio Engineering Labs., Inc., 36-40 37th St., Long Island City, N. Y.
Ⓥ RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
Ⓥ Schuttig & Co., Inc., 9th & Kearney Sts., NE., Washington 17, D. C.
Vokar Corp., 7300 Huron River Drive, Dexter, Mich.
Ⓥ Ward Products Corp., Div. of The Gabriel Corp., 1523 E. 45th St., Cleveland 3, Ohio.
West Coast Electronics Co., 1601 S. Burlington St., Los Angeles 6, Calif.
Ⓥ Wind Turbine Co., Tower & Antenna Div., E. Market St. & Penna. R. R., West Chester, Pa.
Ⓥ Workshop Associates, Inc., 66 Needham St., Newton Highlands 61, Mass.

ANTENNAS—*Fixed Station Antenna Systems*

Ⓥ Air Associates, Inc., Teterboro, N. J.
American Electroneering Co., 2112 S. LaBrea Ave., Los Angeles, Calif.
Ⓥ AMERICAN PHENOLIC CORPORATION, 1830 S. 54th Ave., Chicago 50, Ill. ADV. PG. 191.

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Ⓥ Andrew Corp., 363 E. 75th St., Chicago 19, Ill.
Ⓥ Capehart-Farnsworth Corp., Fort Wayne, Indiana.
Ⓥ Communications Co., Inc., 300 Sands Ave., Coral Gables 34, Fla.
Ⓥ Dielectric Products Co., Inc., 125 Virginia Ave., Jersey City 5, N. J.
Ⓥ Doolittle Radio, Inc., 7421 S. Loomis Blvd., Chicago 36, Ill.
Erie Resistor Corp., Erie, Pa.
Erie Radio Labs., Inc., E. Stewart Ave., Garden City, N. Y.
Ⓥ Gonset Co., 72 E. Tujunga Ave., Burbank, Calif.
Ⓥ The Little Antennae Inc., 1060 Washington Ave., Bronx 56, N. Y.
Ⓥ Maryland Electronic Mfg. Corp., 5009 Calvert Rd., College Park, Md.
Ⓥ Phelps Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Press Wireless Mfg. Co., Inc., Carnegie Rd., Hicksville, L. I., N. Y.
Ⓥ Product Development Co., Inc., Arlington, N. J.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., Central Offices, Camden, N. J. ADV. PG. 73 to 75. Inside Back and Back Covers.
Radio Specialty Mfg. Co., 2023 S. E. Sixth Ave., Portland 14, Ore.
Ⓥ RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
Ⓥ U. H. F. Resonator Co., 224 Seventh St., Racine, Wis.
Ⓥ Vaco Products Corp., Div. of The Gabriel Corp., 1923 E. 45th St., Cleveland 3, Ohio.
West Coast Electronics Co., 1401 S. Burlington St., Los Angeles 6, Calif.
Ⓥ Wind Turbine Co., Tower & Antenna Div., E. Market St. & Penna. R. R., West Chester, Pa.
Ⓥ Workshop Associates, Inc., 66 Needham Street, Newton Highlands 61, Mass.

ANTENNAS—*Ground Plane*

American Electroneering Co., 2112 S. LaBrea Ave., Los Angeles, Calif.
Ⓥ AMERICAN PHENOLIC CORPORATION, 1830 S. 54th Ave., Chicago 50, Ill. ADV. PG. 191.
Ⓥ Andrew Corp., 363 E. 75th St., Chicago 19, Ill.
Ⓥ Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.
Ⓥ Communications Co., Inc., 300 Sands Ave., Coral Gables 34, Fla.
Ⓥ Doolittle Radio, Inc., 7421 S. Loomis Blvd., Chicago 36, Ill.
Ⓥ Lingo & Son, Inc., John E., 2865 St. & Buren, Camden, N. J.
Phelps Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., Central Offices, Camden, N. J. ADV. PG. 73 to 75. Inside Back and Back Covers.
Servo Corp. of America, 20 Jericho Turnpike, New Hyde Park, L. I., N. Y.
Ⓥ Vaco Products Corp., Div. of The Gabriel Co., 1923 E. 45th St., Cleveland 3, Ohio.
Ⓥ Wind Turbine Co., Tower & Antenna Div., E. Market St. & Penna. R. R., West Chester, Pa.
Ⓥ Workshop Associates, Inc., 66 Needham St., Newton Highlands 61, Mass.

ANTENNAS—*Indoor*

Ⓥ AMERICAN PHENOLIC CORPORATION, 1830 S. 54th Ave., Chicago 50, Ill. ADV. PG. 191.
Ⓥ Andrew Corp., 363 E. 75th St., Chicago 19, Ill.
Ⓥ Antenna Specialists Co., 1610 Crocker Ave., Newark 4, N. J.
Ⓥ Cambion, Inc., 32-40 57th St., Woodside, N. Y.
Ⓥ Carrone & Bitter, 2332 Ontario Rd., N. W., Washington 9, D. C.
Ⓥ Consolidated Wire & Associated Companies, 1659 S. Cloverdale Ave., Chicago 23, Ill.
Ⓥ CORNELL-DUBILIER ELECTRIC CORP., South Plainfield, N. J. ADV. PG. 211.
Ⓥ Dragon, Inc., 4069 N. Dixie Drive, Dayton 9, Ohio.
Ⓥ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
Ⓥ Hastie Brothers, Plainfield, N. J.
Ⓥ INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
Ⓥ J. F. D. MFG. CO., 4101-23 Fifteenth Ave., Brooklyn, N. Y. ADV. PG. 274, 275.
La Magna Mfg. Co., Inc., East Rutherford, N. J.
National Electronics Mfg. Corp., 35-05 36th St., Long Island City, N. Y.
Phelps Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Polytron Mfg. Co., Inc., 224 University Place, New York 3, N. Y.
Porter Co., Inc., A. W., 40-46 Gaskell St., Riverside, N. Y.
Ⓥ Polytron Corp., 133 Martine Ave., White Plains, N. Y.
Ⓥ Radart Corp., Plastic Products Div., 6209-15 W. 65th St., Chicago 38, Ill.
Ⓥ Radart Corp., 5571 W. 62nd St., Cleveland 3, Ohio.
Radio Merchandise Sales, 550 Westchester Ave., New York 55, N. Y.
Ⓥ TECHNICAL APPLIANCE CORP., Sherburne, N. Y. ADV. PG. 261.
Ⓥ Tenex, Inc., Box 879, Rutherford & Nesting Highways, Asbury Park, N. J.
Ⓥ Vaco Products Co., 2551 N. Ashland Ave., Chicago 22, Ill.
Ⓥ Vaco Products Corp., Div. of The Gabriel Corp., 1923 E. 45th St., Cleveland 3, Ohio.
Waters Mfg. Co., Inc., 250 East St., New Haven, Conn.

ANTENNAS—*Loop*

Ⓥ AIRCRAFT RADIO CORP., Boonton, N. J. ADV. PG. 198, 199.
Ⓥ Caddell-Burns Mfg. Co., 480 Broome St., New York 13, N. Y.
Elin Laboratories, 18 South Broadway, Dobbs Ferry, N. Y.
Ⓥ FEDERAL TELEPHONE & RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.
Franklin Mfg. Corp., A. W., 44-20 34th St., Long Island City, N. Y.
Guttman Inc., Edwin I., 15 S. Throop St., Chicago, Ill.
Ⓥ HOULIHAN COMPANY, T. J., 2508-14 W. Lawrence Ave., Chicago 25, Ill. ADV. PG. 276.
Ⓥ INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
Jarvis Electronics Corp., 6058 W. Fullerton Ave., Chicago 39, Ill.
Ⓥ Kent Co., F. C., 64-72 Howard St., Irvington, N. J.
Ⓥ Lear, Inc., 110 Ionia Ave., N.W., Grand Rapids 2, Mich.
Meissner Mfg. Div., Maguire Industries, Inc., Mt. Carmel, Ill.
Ⓥ Miller Co., J. W., 5917 Main St., Los Angeles, Calif.
Ⓥ Mitchell Industries, Inc., Camp Wolters, Mineral Wells, Texas.
Ⓥ Molded Insulation Co., Aircraft Control Div., 335 E. Erie St., Philadelphia, Pa.
Ⓥ Phelps Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Polytron Corp., 133 Martine Ave., White Plains, N. Y.
Press Wireless Mfg. Co., Inc., 860 Washington St., Burlington, Iowa.
Ⓥ STANDARD COIL PRODUCTS CO., 2329 Pulaski Rd., Chicago 49, Ill. ADV. PG. 233.
Ⓥ SUPER ELECTRIC PRODUCTS CORP., 46 Oliver St., Newark, N. J.
Ⓥ Stanwyck Winding Co., 137 Walsh Ave., Newburgh, N. Y.
Ⓥ Televiso Engineering Corp., 99 Wall St., New York 5, N. Y.
Vokar Corp., 1300 Huron River Drive, Dexter, Mich.

ANTENNAS—*Marine*

Hush-MiCom Telephone Co., Inc., 25th St. & 3rd Ave., Brooklyn 32, N. Y.
Ⓥ Intervox Corp., 2701 California Ave., Seattle, Wash.
Ⓥ Jefferson Inc., Way, 40 E. Merrick Rd., Freeport, L. I., N. Y.
Ⓥ Premax Products Div., Chisholm-Ryder Co., Inc., Niagara Falls 2, N. Y.
Press Wireless Mfg. Co., Inc., Carnegie Rd., Hicksville, L. I., N. Y.
Ⓥ Radiomarine Corp. of America, 75 Varick St., New York 13, N. Y.
Ⓥ RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
Ⓥ SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.

ANTENNAS—*Microwave*

Ⓥ Airborne Instruments Lab., Inc., 160 Old Country Rd., Mineola, N. Y.
Ⓥ Andrew Corp., 363 E. 75th St., Chicago 19, Ill.
Ⓥ Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.
Bunnell & Co., J. H., 91 Prospect St., Brooklyn, N. Y.
Canso (Canada) Ltd., 301-303 Windsor St., Halifax, N. S., Canada.
Ⓥ FEDERAL TELEPHONE AND RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.
Gustafson Co., Bruce Div., Providence 7, R. I.
Kennedy & Co., D. S., Cohasset, Mass.
La Magna Mfg. Co., Inc., East Rutherford, N. J.
Lear, Inc., 110 Ionia Ave., N.W., Grand Rapids 2, Mich.
Ⓥ Microwave Equipment Co., Inc., North Caldwell, N. J.
Phelps Corp., Tioga & C Sts., Philadelphia 34, Pa.
Press Wireless Mfg. Co., Inc., Carnegie Rd., Hicksville, L. I., N. Y.
Ⓥ Product Development Co., Inc., Arlington, N. J.
Radio Engineering Labs., Inc., 36-40 37th St., Long Island City, N. Y.
Ⓥ RAYTHEON MFG. CO., Equipment Sales Div., Waltham, Mass. ADV. PG. 257.
Sawyer Industries, Inc., 401 E. 134th St., New York 54, N. Y.
Ⓥ SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.
United Industries, Inc., Everett, Mass.
VECTRON, INC., 235 High St., Waltham, Mass. ADV. PG. 264.
Ⓥ Workshop Associates, Inc., 66 Needham St., Newton Highlands 61, Mass.

ANTENNAS—*Radar Receiving & Transmitting*

Ⓥ Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.
Canso (Canada) Ltd., 301-303 Windsor St., Halifax, N. S., Canada.
Ⓥ Electronic Associates, Inc., Long Branch, N. J.
Gustafson Co., Bruce Div., Providence 7, R. I.
Ⓥ I-T-E CIRCUIT BREAKER CO., 19th & Hamilton Sts., Philadelphia 30, Pa. ADV. PG. 40, 41.
Ⓥ INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
Kennedy & Co., D. S., Cohasset, Mass.
Ⓥ Kent Co., F. C., 64-72 Howard St., Irvington, N. J.
Ⓥ Microwave Equipment Co., Inc., North Caldwell, N. J.
Ⓥ Phelps Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Press Wireless Mfg. Co., Inc., Carnegie Rd., Hicksville, L. I., N. Y.
Ⓥ Product Development Co., Inc., Arlington, N. J.
Ⓥ Radiomarine Corp. of America, 75 Varick St., New York 13, N. Y.
Ⓥ RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
Selector Industries, Inc., 401 E. 134th St., New York 54, N. Y.
Ⓥ SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.
Ⓥ Submarine Signal Div., Raytheon Mfg. Co., Waltham, Mass.
United Industries, Inc., Everett, Mass.
VECTRON, INC., 235 High St., Waltham, Mass. ADV. PG. 264.
Ⓥ Workshop Associates, Inc., 66 Needham St., Newton Highlands 61, Mass.

ANTENNAS—*Railroad*

Ⓥ AMERICAN PHENOLIC CORPORATION, 1830 S. 54th Ave., Chicago 50, Ill. ADV. PG. 191.
Ⓥ Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.
Ⓥ Capehart-Farnsworth Corp., Fort Wayne, Indiana.
Ⓥ Communications Co., Inc., 300 Sands Ave., Coral Gables 34, Fla.
Ⓥ Dielectric Products Co., Inc., 125 Virginia Ave., Jersey City 5, N. J.
Gonset Co., 72 E. Tujunga Ave., Burbank, Calif.
Ⓥ Triumph Products Co., 1515 N. Ashland Ave., Chicago 22, Ill.
Ⓥ Workshop Associates, Inc., 66 Needham Street, Newton Highlands 61, Mass.

ANTENNAS—*Rotary Beam*

Ⓥ Collins Radio Co., Cedar Rapids, Iowa.
Ⓥ Electronic Indicator Corp., 43 Wyckoff St., Brooklyn, N. Y.
Ⓥ Gordon Specialties Co., 405 W. North Ave., Chicago 22, Ill.
Ⓥ The Little Antennae Inc., 1060 Washington Ave., Bronx 56, N. Y.
Ⓥ Johnson Co., E. F., Waseca, Minn.
Ⓥ Premax Products Div., Chisholm-Ryder Co., Inc., Niagara Falls 2, N. Y.
Ⓥ Tenex, Inc., Box 879, Rutherford & Nesting Highways, Asbury Park, N. J.
Ⓥ Workshop Associates, Inc., 66 Needham Street, Newton Highlands 61, Mass.

ANTENNAS—*Telescopic*

Ⓥ Antech Mfg. Corp., 200 Centre Ave., Newark 4, N. J.
Ⓥ Cambion, Inc., 32-40 57th St., Woodside, N. Y.
Ⓥ Carrone & Bitter, 2332 Ontario Rd., N. W., Washington 9, D. C.
Ⓥ Doolittle Radio, Inc., 7421 S. Loomis Blvd., Chicago 36, Ill.
Ⓥ Franklin Mfg. Corp., A. W., 44-20 34th St., Long Island City, N. Y.
Ⓥ INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
La Magna Mfg. Co., Inc., East Rutherford, N. J.
Lingo & Son, Inc., John E., 28th St. & Buren, Camden, N. J.
Ⓥ MEASUREMENTS CORP., Boonton, N. J. ADV. PG. 195.
National Electronics Mfg. Corp., 35-05 36th St., Long Island City, N. Y.
Ⓥ Phelps Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Pico Mfg. Co., Inc., 60-64 Gravett St., Brooklyn 11, N. Y.
Ⓥ Premax Products Div., Chisholm-Ryder Co., Inc., Niagara Falls 2, N. Y.
Ⓥ Radart Corp., The, 5571 W. 62nd St., Cleveland 2, Ohio.
Ⓥ RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
Ⓥ Vaco Products Corp., Div. of The Gabriel Co., 1923 E. 45th St., Cleveland 3, Ohio.

ANTENNAS—*Television*

Ⓥ AEROLITE ELECTRONIC HARDWARE CORP., 607 36th St., Union City, N. J. ADV. PG. 146.
Ⓥ AMERICAN PHENOLIC CORPORATION, 1830 S. 54th Ave., Chicago 50, Ill. ADV. PG. 191.
Ⓥ Amy, Aceves & King, Inc., 11 W. 42nd St., New York 18, N. Y.
Ⓥ Antenna Research Lab., Inc., 737 Thomas Lane, Columbus 8, Ohio.
Birnbach Radio Co., Inc., 145 Hudson St., New York, N. Y.
Ⓥ Brach Mfg. Corp., 200 Centre Ave., Newark 4, N. J.
Ⓥ Cambion, Inc., 32-40 57th St., Woodside, N. Y.

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

Ⓥ Carmine & Bitter, 2332 Ontario Rd., NW, Washington 9, D. C.
Ⓥ Channel Master Co., Ellenville, N. Y.
Ⓥ Communication Measurements Lab., Inc., 220 Greenwich St., New York, N. Y.
Ⓥ Consolidated Wire & Associated Companies, 1635 S. Clinton St., Chicago 16, Ill.
Ⓥ CORNELL-DUBILIER ELECTRIC CORP., South Plainfield, N. J. ADV. PG. 70.
Ⓥ Dielectric Products Co., Inc., 125 Virginia Ave., Jersey City 5, N. J.
Ⓥ Dual-Remote Control Co., Garden City, Mich.
Ⓥ Electronic Indicator Corp., 53 Wyckoff St., Brooklyn, N. Y.
Ⓥ Essex Rubber Co., Hackettstown, N. J.
Ⓥ FEDERAL TELEPHONE AND RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.
Ⓥ Franklin Mfg. Corp., A. W., 43-20 34th St., Long Island City 1, N. Y.
Ⓥ Gadgets, Inc., 3269 N. Dixie Drive, Dayton 5, Ohio.
Ⓥ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
Gonset Co., 72 E. Tujunga Ave., Burbank, Calif.
Ⓥ Haydu Brothers, Plainfield, N. J.
Ⓥ Hi-Par Products Co., Fitchburg, Mass.
Ⓥ Hy-Lite Antennae, Inc., 1060 Washington Ave., Bronx 56, N. Y.
Ⓥ INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
Ⓥ J F D MFG. CO., 6101-23 Sixteenth Ave., Brooklyn, N. Y. ADV. PG. 254, 264.
La Magna Mfg. Co., Inc., East Rutherford, N. J.
Ⓥ LaPointe-Plascomold Corp., Unionville, Conn.
Ⓥ Lingo & Son, Inc., John E., 28th St. & Buren, Camden, N. J.
Ⓥ Louis Bros., 3543 E. 16th St., Los Angeles 23, Calif.
Ⓥ Lynmar Electronic Corp., 22 Cass St., Springfield, Mass.
Ⓥ Lynmar Engineers, Inc., 1721 Delancey St., Philadelphia 3, Pa.
National Electronic Mfg. Corp., 35-05 36th St., Long Island City 5, N. Y.
Ⓥ Network Mfg. Corp., Bayonne, N. J.
Ⓥ Oak Ridge Products Mfg. Div. of Video Television Inc., 239 E. 127th St., New York 35, N. Y.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Philson Mfg. Co., Inc., 60-66 Sackett St., Brooklyn 31, N. Y.
Ⓥ Polytron Corp., 133 Martine Ave., White Plains, N. Y.
Ⓥ Precision Plastic Products Inc., 624-30 W. Lake St., Chicago 6, Ill.
Ⓥ Premax Products Div., Chisholm-Ryder Co., Inc., Niagara Falls 2, N. Y.
Ⓥ Ras-El-Co Mfg. Co., 7580 Garfield Blvd., Cleveland 25, Ohio.
Ⓥ Radiart Corp., The, 3571 W. 62nd St., Cleveland 2, Ohio.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75. Inside Back and Back Covers.
Radio Merchandise Sales, 550 Westchester Ave., New York 55, N. Y.
Ⓥ Schott Co., Walter L., 9306 Santa Monica Blvd., Beverly Hills, Calif.
Selectar Industries, Inc., 401 E. 138th St., New York 54, N. Y.
Ⓥ Stolle Engineering & Mfg. Co., 3970 S. Grand Ave., Los Angeles 37, Calif.
Ⓥ TECHNICAL APPLIANCE CORP., Sherburne, N. Y. ADV. PG. 201.
Ⓥ Television Laboratories, Inc., 542 N. Parkside Ave., Chicago 44, Ill.
Ⓥ Telrex, Inc., Box 879, Rutherford & Neptune Highway, Asbury Park, N. J.
Ⓥ Thycraft Products Co., 1535 N. Ashland Ave., Chicago 22, Ill.
Ⓥ U. H. F. Resonator Co., 224 Seventh St., Racine, Wis.
Vokar Corp., 7300 Huron River Drive, Dexter, Mich.
Ⓥ Ward Products Corp., Div. of The Gabriel Co., 1523 E. 45th St., Cleveland 3, Ohio.
Warren Mfg. Co., Inc., 250 East St., New Haven, Conn.
West Coast Electronics Co., 1601 S. Burlington St., Los Angeles 6, Calif.
Ⓥ Workshop Associates, Inc., 66 Needham Street, Newton Highlands 61, Mass.

ANTENNAS—*Television Built-in*

Ⓥ AMERICAN PHENOLIC CORPORATION, 1830 S. 54th Ave., Chicago 50, Ill. ADV. PG. 191.
Ⓥ Haydu Brothers, Plainfield, N. J.
Ⓥ INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
Jamaica Television Mfg. Co., 95-26 Sutphin Blvd., Jamaica 4, N. Y.
La Magna Mfg. Co., Inc., East Rutherford, N. J.
Lansky Die Cutting Co., 192½ Greene St., New York 12, N. Y.
Leonard Electric Products Co., Inc., 1562 61st St., Brooklyn, N. Y.
Ⓥ National Polytronics, Inc., 2430 Atlantic Ave., Brooklyn, N. Y.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Pilmore Mfg. Co., 119 University Place, New York 3, N. Y.
Ⓥ Polytron Corp., 113 Martine Ave., White Plains, N. Y.
Ⓥ Thycraft Products Co., 2535 N. Ashland Ave., Chicago 22, Ill.
Vokar Corp., 7300 Huron River Drive, Dexter, Mich.

ANTENNAS—*Television Multiple Set*

Ⓥ Brach Mfg. Corp., 200 Central Ave., Newark 4, N. J.
Ⓥ CORNELL-DUBILIER ELECTRIC CORP., South Plainfield, N. J. ADV. PG. 70.
Electro Engineering & Mfg. Co., 627 W. Alexandrine, Detroit 1, Mich.
Ⓥ Haydu Brothers, Plainfield, N. J.
Ⓥ Hy-Lite Antennae, Inc., 1060 Washington Ave., Bronx 56, N. Y.
Ⓥ J F D MFG. CO., 6101-23 Sixteenth Ave., Brooklyn, N. Y. ADV. PG. 254, 264.
Jamaica Television Mfg. Co., 95-26 Sutphin Blvd., Jamaica 4, N. Y.
Ⓥ Lynmar Engineers, Inc., 1721 Delancey St., Philadelphia 3, Pa.
Ⓥ Polytron Corp., 133 Martine Ave., White Plains, N. Y.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 75. Inside Back and Back Covers.
Ⓥ TECHNICAL APPLIANCE CORP., Sherburne, N. Y. ADV. PG. 201.
Ⓥ Television Equipment Corp., 238 William St., New York, N. Y.
Vokar Corp., 7300 Huron River Drive, Dexter, Mich.
Ⓥ Workshop Associates, Inc., 66 Needham St., Newton Highlands 61, Mass.

ANTENNAS—*uhf & vhf*

Ⓥ Aeronautical Radio Mfg. Co., 199 First St., Mineola, N. Y.
Ⓥ Air Associates, Inc., Teterboro, N. J.
American Electroneering Co., 2112 S. Ladrea Ave., Los Angeles, Calif.
Ⓥ Amy, Aceves & King Inc., 11 W. 42nd St., New York 18, N. Y.
Ⓥ Andrew Corp., 363 E. 75th St., Chicago 19, Ill.
Ⓥ Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.
Birnbach Radio Co., Inc., 145 Hudson St., New York, N. Y.
Ⓥ Carmine & Bitter, 2332 Ontario Rd., NW, Washington 9, D. C.
Ⓥ Collins Radio Co., Cedar Rapids, Iowa.
Ⓥ Communication Products Co., Inc., Broadway & Clark St., Keyport, N. J.
Ⓥ Communications Co., Inc., 300 Greco Ave., Coral Gables 34, Fla.
Ⓥ CORNELL-DUBILIER ELECTRIC CORP., South Plainfield, N. J. ADV. PG. 70.
Ⓥ Doolittle Radio, Inc., 7421 S. Loomis Blvd., Chicago 36, Ill.
Ⓥ Electronic Indicator Corp., 53 Wyckoff St., Brooklyn, N. Y.
Gonset Co., 72 E. Tujunga Ave., Burbank, Calif.
Ⓥ Hy-Lite Antennae, Inc., 1060 Washington Ave., Bronx 56, N. Y.
Ⓥ INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
Jamaica Television Mfg. Co., 95-26 Sutphin Blvd., Jamaica 4, N. Y.
Kennedy & Co., D. S., Cohasset, Mass.
La Magna Mfg. Co., Inc., East Rutherford, N. J.
Ⓥ Lear, Inc., 110 Ionia Ave., N.W., Grand Rapids 2, Mich.
Ⓥ Link Radio Corp., 125 W. 17th St., New York, N. Y.
Ⓥ Manufacturers Thread Grinding, Inc., P. O. Box 66, Eatontown, N. J.
Ⓥ Mitchell Industries, Inc., Camp Wolters, Mineral Wells, Texas.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Premax Products Div., Chisholm-Ryder Co., Inc., Niagara Falls 2, N. Y.
Ⓥ Product Development Co., Inc., Arlington, N. J.
Ⓥ Radio Engineering Labs., Inc., 36-40 37th St., Long Island City, N. Y.
Radio Specialty Mfg. Co., 2023 S. E. Sixth Ave., Portland 14, Ore.
Ⓥ RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
Selectar Industries, Inc., 401 E. 138th St., New York 54, N. Y.
Vexley Inc., 91 Cambridge St., Boston, Mass.
Ⓥ SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.
Ⓥ Super Electric Products Corp., 46 Oliver St., Newark, N. J.
Ⓥ TECHNICAL APPLIANCE CORP., Sherburne, N. Y. ADV. PG. 201.
Ⓥ Telrex, Inc., Box 879, Rutherford & Neptune Highway, Asbury Park, N. J.
Ⓥ U. H. F. Resonator Co., 224 Seventh St., Racine, Wis.
Ⓥ Ward Products Corp., Div. of The Gabriel Co., 1523 E. 45th St., Cleveland 3, Ohio.
Ⓥ Wind Turbine Co., Tower & Antenna Div., E. Market St. & Penna. R.R., West Chester, Pa.
Ⓥ Workshop Associates, Inc., 66 Needham St., Newton Highlands 61, Mass.

ARRESTORS—*Lightning*

Ⓥ AMERICAN PHENOLIC CORPORATION, 1830 S. 54th Ave., Chicago 50, Ill. ADV. PG. 191.
Birnbach Radio Co., Inc., 145 Hudson St., New York, N. Y.
Ⓥ Brach Mfg. Corp., 200 Central Ave., Newark 4, N. J.
Ⓥ Camburn, Inc., 32-40 57th St., Woodside, N. Y.
Cleveland Electronics, Inc., 6611 Euclid Ave., Cleveland, Ohio.
Ⓥ Consolidated Wire & Associated Companies, 1635 S. Clinton St., Chicago 16, Ill.
Eagle Electric Mfg. Co., Inc., 23-10 Bridge Plaza S., Long Island City, N. Y.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 9 to 16.
Ⓥ INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
Ⓥ J F D MFG. CO., 6101-23 Sixteenth Ave., Brooklyn, N. Y. ADV. PG. 254, 264.
Ⓥ LaPointe Plascomold Corp., Unionville, Conn.
Ⓥ NATIONAL CARBON DIVISION, Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y. ADV. PG. 109.
National Electronic Mfg. Corp., 35-05 36th St., Long Island City 5, N. Y.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75. Inside Back and Back Covers.
Radio Merchandise Sales, 550 Westchester Ave., New York 54, N. Y.
Ⓥ Smith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.
Ⓥ TECHNICAL APPLIANCE CORP., Sherburne, N. Y. ADV. PG. 201.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

ATTENUATORS

American British Technology Inc., 57 Park Ave., New York 16, N. Y.
Ⓥ CENTRALAB, DIV. of Globe-Union Inc., 900 E. Keefe Ave., Milwaukee 1, Wis. ADV. PG. 64, 65.
Ⓥ CINEMA ENGINEERING CO., 1510 W. Verdugo Ave., Burbank, Calif. ADV. PG. 186.
Ⓥ Clarke Instrument Corp., 910 King St., Silver Spring, Md.
Ⓥ CLAROSTAT MFG. CO., INC., Dover, N. H. ADV. PG. 227.
Coil Winders, Inc., 61 Bergen St., Brooklyn 2, N. Y.
Ⓥ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ CORNING GLASS WORKS, Corning, N. Y. ADV. PG. 134.
Ⓥ Daven Co., 191 Central Ave., Newark 4, N. J.
Ⓥ Electronic Associates, Inc., Long Branch, N. J.
Ⓥ ELECTRONIC MEASUREMENTS CO., Red Bank, N. J. ADV. PG. 139.
Ⓥ Fairchild Recording Equipment Corp., 154th St. & 7th Avenue, Whitestone, N. Y.
Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Ⓥ House of Television Inc., 40 W. 4th St., New York 12, N. Y.
Ⓥ INDUSTRIAL ELECTRONICS, INC., 2457 Woodward Ave., Detroit 1, Mich. ADV. PG. 255.
Ⓥ Kalbfell Labs., Inc., 1076 Morena Blvd., San Diego 10, Calif.
Ⓥ KAY ELECTRIC CO., 14 Maple Ave., Pine Brook, N. J. ADV. PG. 193.
Ⓥ KEITHLEY INSTRUMENTS, 1507 Warrensville Center Rd., Cleveland 21, Ohio. ADV. PG. 216.
Ⓥ Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
Ⓥ Livingston Electronic Corp., Livingston, N. J.
Ⓥ Mallory & Co., Inc., P. R., 3029 E. Washington St., Indianapolis 6, Ind.
Ⓥ Manufacturers Thread Grinding Inc., P. O. Box 66, Eatontown, N. J.
Ⓥ MEASUREMENTS CORP., Boonton, N. J. ADV. PG. 145.
Microwave Equipment Co., North Caldwell, N. J.
Ⓥ MUIRHEAD & CO., LTD., Beckenham-Kent England. ADV. PG. 71.
Ⓥ ORMITE MFG. CO., 4835 W. Flournoy St., Chicago 44, Ill. ADV. PG. 83.
Ⓥ SHALLCROSS MFG. CO., 10 Jackson Ave., Collingsdale, Pa. ADV. PG. 221.
Ⓥ SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ Tech Laboratories Inc., Bergen & Efaull Blvd., Palisades Park, N. J.

ATTENUATORS—*Microwave Coaxial Fixed*

Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ C.G.S. LABORATORIES, INC., 36 Ludlow St., Stamford, Conn. ADV. PG. 244.
Ⓥ CORNING GLASS WORKS, Corning, N. Y. ADV. PG. 134.
Ⓥ KAY ELECTRIC CO., 14 Maple Ave., Pine Brook, N. J. ADV. PG. 193.

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

Ⓥ Kings Electronics Co., Inc., 811 Lexington Ave., Brooklyn 21, N. Y.
Ⓥ Manhattan Equipment Co., Inc., North Caldwell, N. J.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ POLYTECHNIC RESEARCH & DEVELOPMENT CO., INC., 202 Tillary St., Brooklyn 1, N. Y. ADV. PG. 56, 57.
Ⓥ Rollin Co., 2070 N. Fair Oaks Ave., Pasadena 3, Calif.
Ⓥ Schutter, Carl W., Rockville Centre, N. Y.
Selector Industries, Inc., 401 E. 138th St., New York 54, N. Y.
VECTRON, INC., 235 High St., Waltham, Mass. ADV. PG. 356.
Ⓥ Weinschel Engineering Co., 123 William St., New York 7, N. Y.
Ⓥ Weymouth Instrument Co., 1440 Commercial St., East Weymouth 89, Mass.

ATTENUATORS—*Microwave Step*

Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ C. G. S. LABORATORIES, INC., 36 Ludlow St., Stamford, Conn. ADV. PG. 244.
Ⓥ Daven Co., 191 Central Ave., Newark 4, N. J.
Ⓥ RAY ELECTRIC CO., 14 Maple Ave., Pine Brook, N. J. ADV. PG. 193.
Ⓥ Kings Electronics Co., Inc., 811 Lexington Ave., Brooklyn 21, N. Y.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Schutter, Carl W., Rockville Centre, N. Y.
Selector Industries, Inc., 401 E. 138th St., New York 54, N. Y.
Ⓥ Tech Laboratories, Inc., Bergen & Edsall Blvds., Palisades Park, N. J.
Ⓥ Varian Associates, 99 Washington St., San Carlos, Calif.
Ⓥ Weinschel Engineering Co., 123 William St., New York 7, N. Y.

AUDIOMETERS

Ⓥ Aurex Corp., 1117 N. Franklin St., Chicago, Ill.
Ⓥ Maico Co., Inc., 21 North Third St., Minneapolis 1, Minn.
Ⓥ Marion Instrument Lab., 24 Bauer St., New York 4, N. Y.
Ⓥ Precision Electronics, 441 Milwaukee Ave., Chicago 22, Ill.
Ⓥ Tech Laboratories, Inc., Bergen & Edsall Blvds., Palisades Park, N. J.

BAFFLES—*Microphone*

Ⓥ Altec Lansing Corp., 161 Avenue of the Americas, New York 13, N. Y.
Ⓥ ELECTRO-VOICE, INC., Buchanan, Mich. ADV. PG. 237.
Ⓥ Racon Electric Co., 52 E. 19th St., New York 3, N. Y.
Stephens Mfg. Corp., 9538 Warner Drive, Culver City, Calif.

BAFFLES—*Speaker*

Ⓥ Altec Lansing Corp., 161 Avenue of the Americas, New York 13, N. Y.
American Communications Corp., 306 Broadway, New York 7, N. Y.
Ⓥ Atlas Sound Corp., 1443 39th St., Brooklyn 18, N. Y.
Ⓥ Bogen Co., Inc., David, 663 Broadway, New York 12, N. Y.
Castleman Mfg. Co., 13th & Burnett Sts., Louisville, Ky.
Collins Radio Co., Cedar Rapids, Iowa.
Ⓥ ELECTRO-VOICE, INC., Buchanan, Mich. ADV. PG. 307.
Hartley Co., Ltd., H. A., 152 Hammersmith Rd., London W. 4, England.
Ⓥ Illinois Wood Products Corp., 1666 N. Besly Court, Chicago 22, Ill.
Langevin Co., The, 1921½ Greene St., New York, N. Y.
Ⓥ Magnavox Electronics Co., 2707-11 W. Jefferson, Los Angeles 16, Calif.
Ⓥ Moore Co., Howard J., 108 Park Row, New York 7, N. Y.
Ⓥ Par-K Sound Inc., A., 4757-59 Melrose St., Philadelphia 41, Pa.
Ⓥ Symmetric Mfg. Co., 1410 N. Indiana Sts., St. Charles, Ill.
Ⓥ Rankin Corp., The, 611 W. Division St., Chicago 10, Ill.
Ⓥ Remington Corp., 1400 W. Grand Ave., Chicago 22, Ill.
Ⓥ Radio Electric Service Co., 52 E. 19th St., New York 3, N. Y.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 75. Inside Back and Back Covers.
Radio Music Corp., Port Chester, N. Y.
Ⓥ Simpson Mfg. Co., Inc., Mark, 32-28 49th St., Long Island City 3, N. Y.
Stephens Mfg. Corp., 9538 Warner Drive, Culver City, Calif.
Ⓥ Tipping Mfg. Co., 4587 Mission St., San Francisco 10, Calif.
Ⓥ UNIVERSITY LOUDSPEAKERS, INC., 80 S. Kensico Ave., White Plains, N. Y. ADV. PG. 231.
Ⓥ Vitasic Corporation, 425 Bush St., San Francisco 8, Calif.
Willard's, Hampton, Mass.

BARRETTERS

Ⓥ MEASUREMENTS CORP., Boonton, N. J. ADV. PG. 245.
Ⓥ North American Philips Co., 100 E. 42nd St., New York 17, N. Y.
Ⓥ POLYTECHNIC RESEARCH & DEVELOPMENT CO., INC., 202 Tillary St., Brooklyn 1, N. Y. ADV. PG. 56, 57.
Ⓥ SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.

BASES—*Relay*

Ⓥ ALDEN PRODUCTS CO., 117 No. Main St., Brockton 64, Mass.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ HERMETIC SEAL PRODUCTS CO., 29-37 South 6th St., Newark 7, N. J. ADV. PG. 87.
Ⓥ INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
Ⓥ Kulka & Zeeb Molding & Tool Co., 1700 Southard St., Trenton, N. J.

BATTERIES—*Dry*

Acme Battery Co., 59 Pearl St., Brooklyn 1, N. Y.
Ⓥ Bond Electric Corp., Div. of Olin Industries, Inc., New Haven 4, Conn.
Ⓥ Bright Star Battery Co., 200 Crooks Ave., Clifton, N. J.
Ⓥ BURGESS BATTERY CO., Battery Div., Freeport, Ill. ADV. PG. 26.
Ⓥ General Dry Batteries, Inc., 11003 Athens Ave., Cleveland 7, Ohio.
Ⓥ Kellogg Switchboard & Supply Co., 6650 S. Cicero Ave., Chicago 38, Ill.
Ⓥ Mallory & Co., Inc., P. R., 3029 E. Washington St., Indianapolis 6, Ind.
Ⓥ Manufacturers Battery Co., Sub. of Ray-O-Vac Co., Madison 4, Wis.
Ⓥ NATIONAL CARBON DIVISION, Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y. ADV. PG. 109.
Ⓥ Olin Industries, Inc., Electrical Div., New Haven 4, Conn.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75. Inside Back and Back Covers.
Ⓥ Ray-O-Vac Co., Madison, Wisconsin.
Ⓥ SPECIALTY BATTERY CO., Madison 4, Wisconsin. ADV. PG. 60.
Ⓥ Winchester Repeating Arms Co., Div. of Olin Industries, Inc., New Haven, Conn.
Ⓥ Willard Storage Battery Co., 246 E. 131st St., Cleveland 1, Ohio.

BATTERIES—*Standard Cell*

Acme Battery Co., 59 Pearl St., Brooklyn 1, N. Y.
Ⓥ Bond Electric Corp., Div. of Olin Industries, Inc., New Haven, Conn.
Ⓥ Bright Star Battery Co., 200 Crooks Ave., Clifton, N. J.
Ⓥ BURGESS BATTERY CO., Battery Div., Freeport, Ill. ADV. PG. 26.
Ⓥ Kellogg Switchboard & Supply Co., 6650 S. Cicero Ave., Chicago 38, Ill.
Ⓥ Manufacturers Battery Co., Wauwatosa, Wis.
Ⓥ Victoreen Co., 127 W. 64th St., New York 23, N. Y.
Ⓥ Winchester Repeating Arms Co., Div. of Olin Industries, Inc., New Haven, Conn.

BATTERIES—*Storage*

Ⓥ Baker & Co., Inc., 113 Astor St., Newark 5, N. J.
Ⓥ Bowers Battery & Spark Plug Co., Reading, Pa.
Ⓥ Edison Storage Battery Div., of Thomas A. Edison Inc., Main St. at Lakeside Ave., W. Orange, N. J.
Ⓥ Electric Autolite Co., The, Toledo 1, Ohio.
Ⓥ Electric Storage Battery Co., Allegheny Ave. & 19th St., Philadelphia 32, Pa.
Ⓥ Gould Storage Battery Corp., 35 Nagog St., DePew, N. Y.
Ⓥ Kellogg Switchboard & Supply Co., 6650 S. Cicero Ave., Chicago 38, Ill.
Ⓥ Mojonnier Bros., J. A., 37-01 31st St., Long Island City, N. Y.
Ⓥ Nickel Cadmium Battery Corp., Easthampton, Mass.
Ⓥ Victoreen Co., The, 127 W. 64th St., New York 23, N. Y.
Ⓥ Willard Storage Battery Co., 246 E. 131st St., Cleveland 1, Ohio.

BATTERIES—*Storage Nonspill*

Ⓥ Bowers Battery & Spark Plug Co., Reading, Pa.
Ⓥ Electric Storage Battery Co., Allegheny Ave. & 19th St., Philadelphia 32, Pa.
Ⓥ Electronic Batteries Inc., Bush Terminal Bldg., No. 4, 24-34 Thirty Fifth St., Brooklyn 32, N. Y.
Ⓥ Nickel Cadmium Battery Corp., Easthampton, Mass.
Ⓥ Sonotone Corp., P. O. Box 220, Saw Mill River Rd., Elmsford, N. Y.
Ⓥ Victoreen Co., The, 127 W. 64th St., New York 23, N. Y.

BATTERY CHARGERS

Ⓥ ACME ELECTRIC CORP., 31 Water St., Cuba, N. Y. ADV. PG. 210.
American Communications Corp., 306 Broadway, New York 7, N. Y.
Ⓥ AMERICAN TELEVISION & RADIO CO., 300 E. 4th St., St. Paul 1, Minn. ADV. PG. 279.
Ⓥ Automatic Electric Sales Corp., 1033 W. Van Buren St., Chicago 7, Ill.
Ⓥ Baldor Electric Co., 4351 Duncan Avenue, St. Louis, Mo.
Ⓥ Bowers Battery & Spark Plug Co., Reading, Pa.
Ⓥ Connecticut Telephone & Electric Div., Great American Industries, Inc., 70 Britannia St., Meriden, Conn.
Ⓥ Doolittle Radio, Inc., 7421 S. Loomis Blvd., Chicago 36, Ill.
Ⓥ Dressler Electric Co., 942 E. Larned St., Detroit 7, Mich.
Ⓥ Electric Heat Control Co., 9123 Inman Ave., Cleveland 5, Ohio.
Ⓥ Electric Products Co., 1725 Clarkstone Rd., Cleveland 12, Ohio.
Ⓥ Electric Storage Battery Co., Allegheny Ave. & 19th St., Philadelphia 32, Pa.
Electrical Transformer Co., Westerly Rd., Dosining, N. Y.
Ⓥ Electric Engineering Works, 6021 College Ave., Oakland 18, Calif.
Electron Equipment Corp., 917 Meridian Ave., South Pasadena, Calif.
Electronic Products Div., Epco Products, Inc., 2430 Atlantic Ave., Brooklyn 33, N. Y.
Ⓥ Fansteel Metallurgical Corp., 2200 Sheridan Rd., North Chicago, Ill.
Ⓥ FEDERAL TELEPHONE AND RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Hartner Electric Co., 12640 Elmwood Ave., Cleveland 11, Ohio.
Ⓥ Kato Engineering Co., 1415 First Ave., Mankato, Minn.
Ⓥ Kellogg Switchboard & Supply Co., 6650 S. Cicero Ave., Chicago 38, Ill.
Ⓥ Kurman Products Corp., 112 F. St., Lorain, Ohio.
Ⓥ McCullom-Christie Corp., 4922 S. Figueroa St., Los Angeles 37, Calif.
Ⓥ Magnetic Instrument Co., 82 W. Main St., West Orange, N. J.
Ⓥ Mallory & Co., Inc., P. R., 3029 E. Washington St., Indianapolis 6, Ind.
Ⓥ Mallinckrodt Chemical Works, Rochester 2, N. Y.
Ⓥ MODEL RECTIFIER CORP., 1510 Nostrand Ave., Brooklyn 26, N. Y. ADV. PG. 279.
Ⓥ Norris Electric Mfg. Co., 501 S. Market St., Galion, Ohio.
Northeastern Engineering, Inc., Manchester, N. H.
Ⓥ OPAD GREEN CO., 71 Warren St., New York 7, N. Y. ADV. PG. 274.
Ⓥ Phase Equipment Co., 45 Antoinette St., Detroit 2, Mich.
Ⓥ Radiart Corp., 3571 W. 62nd St., Cleveland, Ohio.
Ⓥ RAYTHEON MFG. CO., Power Tube Div., Waltham 54, Mass. ADV. PG. 257.
Ⓥ Rectifier Engineering Co., 1803 E. Seventh St., Los Angeles 21, Calif.
Richardson Allen Corp., 15 W. 20th Street, New York 11, N. Y.
Ⓥ Richardson Mfg. Corp., 2119 Reading Rd., Cincinnati 2, Ohio.
Ⓥ Sonotone Corp., P. O. Box 300, Saw Mill River Rd., Elmsford, N. Y.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ Thor Electric & Machine Works, 19 S. Jefferson St., Chicago 6, Ill.
Ⓥ Victoreen Co., The, 127 W. 64th St., New York 23, N. Y.
Vokar Corp., 7300 Huron River Drive, Dexter, Mich.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Ⓥ Willard Storage Battery Co., 246 E. 131st St., Cleveland 1, Ohio.

BATTERY CHARGERS—*Gas Engine Driven*

Ⓥ Electric Products Co., 1725 Clarkstone Rd., Cleveland 12, Ohio.
Ⓥ Geophysical Instrument Co., 1828 N. Nash St., Arlington, Va.
Ⓥ Onan & Sons Inc., D. W., 3264 Royalston Ave., Minneapolis 5, Minn.
Ⓥ Victoreen Co., 127 W. 64th St., New York 23, N. Y.

BEARINGS—*Jewel*

Ⓥ Steel Co., Herman D., Lafayette Bldg., Philadelphia 6, Pa.
Ⓥ Swiss Jewel Co., Lafayette Bldg., Philadelphia 6, Pa.
Ⓥ Vallorbe Jewel Co., Lancaster, Pa.

BEARINGS—*Miniature*

American Electroneering Co., 2112 S. LaBrea Ave., Los Angeles, Calif.
Ⓥ Amplex Division Chrysler Corp., Detroit 31, Mich.

(V)Fafnir Bearing Co., South Street, New Britain, Conn.
(V)Gatti Inc., Aurele M., 524 E. Washington St., Trenton, N. J.
(V)Landis & Gyr, Inc., 104 Fifth Ave., New York 11, N. Y.
(V)MINIATURE PRECISION BEARINGS, INC., Keene, N. H. ADV. PG. 189.
(V)NEW HAMPSHIRE BALL BEARINGS, S Main St., Peterborough, N. H. ADV. PG. 209.
(V)U. S. Graphite Co., Saginaw, Mich.

BELLOWS

(V)Chicago Metal Hose Corp., 1309 S. Third Ave., Maywood, Ill.
Cook Electric Co., 2700 Southport Ave., Chicago 14, Ill.
Eastern Metals Industries, 250 W. 54th St., New York 19, N. Y.
(V)Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville 4, Tenn.

BELTS—*Dial Drive*

(V)GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
(V)J F D MFG. CO., 6101-23 Sixteenth Ave., Brooklyn, N. Y. ADV. PG. 254, 264.
(V)Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
(V)Schott Co., Walter L., 9306 Santa Monica Blvd., Beverly Hills, Calif.
(V)Ton-Tex Corp., 247 Pearl St., N. W., Grand Rapids 2, Mich.
(V)White Dental Mfg. Co., S. S., Industrial Div., 10 E. 40th St., New York, N. Y.

BENCH TEST SET-UPS

Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
(V)Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
(V)Eastern Specialty Co., Philadelphia 40, Pa.
Electronic Brushing Co., 140 Glenridge Ave., Montclair, N. J.
(V)Feller Engineering Co., 1601 S. Federal St., Chicago 16, Ill.
(V)Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
(V)Servomechanisms, Inc., 142 Mineola Blvd., Mineola, N. Y.

BLOCKS—*Fuse Blocks & Holders*

(V)ALDEN PRODUCTS CO., 117 N. Main St., Brockton 64, Mass. ADV. PG. 235.
(V)BUSSMANN MFG. CO., St. Louis 7, Mo. ADV. PG. 82.
(V)CINCH MFG. CORP., 1026 S. Homan Ave., Chicago 24, Ill. ADV. PG. 154.
(V)Connecticut Telephone & Electric Div., Great American Industries, Inc., 70 Britannia St., Meriden, Conn.
(V)Dante Electric Mfg. Co., Raritan, Conn.
(V)Franklin Mfg. Corp., A. W., 43-20 34th St., Long Island City, N. Y.
(V)GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 10.
Insulation Mfg. Co., 11 New York Ave., Brooklyn, N. Y.
(V)JONES DIV., HOWARD B., Cinch Mfg. Corp., 1026 S. Homan Ave., Chicago 24, Ill. ADV. PG. 155.
(V)Kulton Electric Mfg. Co., 123 N. J. Railroad Ave., Newark 5, N. J.
(V)LITTELFUSE, INC., 4757 Ravenswood Ave., Chicago 40, Ill. ADV. PG. 164.
(V)Locke Incorporated, P. O. Box 57, Baltimore 3, Md.
Loral Electronics Corp., 794 E. 140th St., New York 54, N. Y.
(V)Pendleton Electric Corp., 315 State St., Erie, Pa.
(V)RAYTHEON MFG. CO., Power Tube Div., Waltham 54, Mass. ADV. PG. 257.
(V)Wade Electric Products Co., 211 Jacob St., Sturgis, Mich.

BLOWERS—*Small*

Dynamic Air Engineering, Inc., 1619 So. Alameda St., Los Angeles 21, Calif.
(V)EASTERN AIR DEVICES, INC., 585 Dean St., Brooklyn 17, N. Y. ADV. PG. 268.
(V)Electrical Controls & Instrument Corp., 88-06 Van Wyck Blvd., Jamaica 1, N. Y.
(V)Fasco Industries, Inc., Rochester 2, N. Y.
(V)Globe Industries, 125 Sunnise Place, Dayton, Ohio.
(V)Ideal Industries, Inc., Park & Borden Aves., Sycamore, Ill.
(V)Ilg Electric Ventilating Co., 2850 N. Crawford Ave., Chicago 41, Ill.
(V)Lerman Brothers, 114 Christie St., Newark 5, N. J.
(V)Redmond Co., Inc., Owosso, Mich.
Ripley Co. Inc., P. O. Box 31, Middletown, Conn.
(V)Rotron Mfg. Co., Inc., 7-9 Schoonmaker Lane, Woodstock, N. Y.
(V)Small Motors, Inc., 2076 Elston Ave., Chicago 14, Ill.
(V)Universal Electric Co., 300 E. Main St., Owosso, Mich.
(V)WESTINGHOUSE ELECTRIC CORP., P. O. 868, Pittsburgh 30, Pa. ADV. PG. 77.

BOARDS—*Capacitor or Resistor*

(V)AEROLITE ELECTRONIC HARDWARE CORP., 507 26th St., Union City, N. J. ADV. PG. 138.
(V)AIRCRAFT RADIO CORP., Boonton, N. J. ADV. PG. 198, 199.
(V)CINCH MFG. CORP., 1026 S. Homan Ave., Chicago 24, Ill. ADV. PG. 154.
(V)Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
(V)Doolittle Radio, Inc., 7421 S. Loomis Blvd., Chicago 36, Ill.
(V)Franklin Mfg. Corp., A. W., 43-20 34th St., Long Island City, N. Y.
(V)JONES DIV., HOWARD B., Cinch Mfg. Corp., 1026 S. Homan Ave., Chicago 24, Ill. ADV. PG. 155.
(V)Keystone Electronic Co., 50-52 Franklin St., New York 13, N. Y.
Loral Electronics Corp., 794 E. 140th St., New York 54, N. Y.
Meissner Mfg. Div., Maguire Industries, Inc., Mt. Carmel, Ill.
(V)Molded Mfg. Co., James, 150 Exchange St., Malden, Mass.
Ripley Co., Inc., P. O. Box 31, Middletown, Conn.
(V)U. S. Engineering Co., 521 Commercial St., Glendale 3, Calif.

BOBBINS—*Coil Winding*

A P W Co., 72 W. Main St., Rockaway, N. J.
(V)AEROLITE ELECTRONIC HARDWARE CORP., 507 26th St., Union City, N. J. ADV. PG. 138.
(V)AMERICAN LAVA CORP., Chattanooga 5, Tenn. ADV. PG. 27.
(V)AMERICAN MOLDED PRODUCTS CO., 1644 N. Homire St., Chicago 22, Ill. ADV. PG. 263.
Beach Precision Parts Co., Boonton, N. J.
(V)CLEVELAND CONTAINER CO., THE, 6201 Barberton Ave., Cleveland 2, Ohio. ADV. PG. 153.
(V)Connecticut Telephone & Electric Div., Great American Industries, Inc., 70 Britannia St., Meriden, Conn.
(V)Electron Mfg. Co., 4546 Elston Ave., Chicago, Ill.
(V)Emerick Co., Inc., The, 1239 Central Ave., Hillside 5, N. J.
(V)FREED TRANSFORMER CO., INC., 1736 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 143.
Insulation Mfg. Co., 11 New York Ave., Brooklyn, N. Y.
(V)Kirchberger & Co., Inc., M., 1425 Thirty-Seventh Street, Brooklyn 18, N. Y.
(V)Klein & Jacob Molding & Tool Co., 1200 Southland St., Trenton, N. J.
(V)Maxtar Molded Products Corp., 4440 N. Elston Ave., Chicago 30, Ill.
(V)PRECISION PAPER TUBE CO., 2033 W. Charleston St., Chicago 47, Ill. ADV. PG. 215.
Solon Electronics Co., 3020 S. South Park, Chicago, Ill.
(V)SHALLCROSS MFG. CO., 10 Jackson Ave., Collingdale, Pa. ADV. PG. 221.
South Mfg. Co., Nathan P., 105 Pasadena Ave., S. Pasadena, Calif.
(V)Thor Ceramics, Inc., 225 Belleville Ave., Bloomfield, N. J.
(V)Weymouth Instrument Co., 1440 Commercial St., East Weymouth 89, Mass.

BOLOMETERS

(V)Baird Associates, Inc., 33 University Rd., Cambridge 38, Mass.
(V)Fredericks Co., Geo. E., Bethayres, Pa.
(V)General R-F Fittings Co., 126 Dartmouth St., Boston 16, Mass.
(V)GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
(V)Microwave Equipment Co., Inc., North Caldwell, N. J.
(V)POLYTECHNIC RESEARCH & DEVELOPMENT CO., INC., 202 Tillary St., Brooklyn 1, N. Y. ADV. PG. 56, 57.
(V)SERVO CORP. OF AMERICA, 2020 Jericho Turnpike, New Hyde Park, N. Y. ADV. PG. 269.
(V)SHALLCROSS MFG. CO., 10 Jackson Ave., Collingdale, Pa. ADV. PG. 221.
(V)SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.
(V)Weston Aliberti Instrument Co., 5351 Pulaski Ave., Philadelphia 44, Pa.
(V)Weymouth Instrument Co., 1440 Commercial St., East Weymouth 89, Mass.

BOLTS

(V)Allmetal Screw Products Co., Inc., 33 Greene St., New York 13, N. Y.
(V)American Screw Co., Willimantic, Conn.
(V)Autoscrew Co., 216-222 W. 18th St., New York, N. Y.
(V)Central Screw Co., 3501 Shields Ave., Chicago 9, Ill.
(V)Chase Brass & Copper Co., Inc., Waterbury 91, Conn.
(V)Continental Screw Co., New Bedford, Mass.
(V)FEDERAL SCREW PRODUCTS, INC., 224 W. Huron St., Chicago 10, Ill. ADV. PG. 271.
(V)GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
(V)Greene Mfg. Corp., G. G., Warren, Pa.
(V)Harper Co., H. M., 8200 Lehigh Ave., Morton Grove, Ill.
(V)J F D MFG. CO., 6101-23 Sixteenth Ave., Brooklyn, N. Y. ADV. PG. 254, 264.
(V)Lamson & Sessions Co., 1971 W. 85th St., Cleveland, Ohio.
(V)Locke Incorporated, P. O. Box 57, Baltimore 3, Md.
(V)National Screw & Mfg. Co., The, Cleveland 4, Ohio.
(V)Pheoli Mfg. Co., 5700 Roosevelt Rd., Chicago 50, Ill.
(V)Progressive Mfg. Co., 50 Norwood St., Torrington, Conn.
(V)Republic Steel Corp., Republic Bldg., Cleveland 1, Ohio.
(V)Ryerson & Son, Inc., J. T., Box 8000-A, Chicago, Ill.
(V)Schott Co., Walter L., 9306 Santa Monica Blvd., Beverly Hills, Calif.
(V)Smith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.
South River Metal Products Co., South River, N. J.
(V)Stronghold Screw Products, Inc., 216-222 West Hubbard St., Chicago 10, Ill.
(V)Vallorbs Jewel Co., Lancaster, Pa.

BOLTS—*Expansion*

(V)Ackerman-Johnson Co., 625 W. Jackson Blvd., Chicago 6, Ill.
(V)Arro Expansion Bolt Co., Boone Ave., Marion, Ohio.
(V)Chase Brass & Copper Co., Inc., Waterbury 91, Conn.
(V)Chicago Expansion Bolt Co., 1338 W. Concord Pl., Chicago 22, Ill.
(V)FEDERAL SCREW PRODUCTS INC., 224 W. Huron St., Chicago 10, Ill. ADV. PG. 271.
(V)Harper Co., H. M., 8200 Lehigh Ave., Morton Grove, Ill.
(V)Greene Mfg. Corp., G. G., Warren, Pa.
(V)Locke Incorporated, P. O. Box 57, Baltimore 3, Md.
(V)National Lead Co., 111 Broadway, New York 6, N. Y.
(V)National Screw & Mfg. Co., The, Cleveland 4, Ohio.
(V)Smith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.
(V)Star Expansion Products Co., 147-149 Cedar St., New York 6, N. Y.
(V)United Screw & Bolt Corp., 2513 W. Cullerton St., Chicago 8, Ill.

BOLTS—*Eye*

(V)Ackerman-Johnson Co., 625 W. Jackson Blvd., Chicago 6, Ill.
(V)Allmetal Screw Products Co., Inc., 33 Greene St., New York 13, N. Y.
Eastern Metals Industries, 250 W. 54th St., New York 19, N. Y.
(V)FEDERAL SCREW PRODUCTS INC., 224 W. Huron St., Chicago 10, Ill. ADV. PG. 271.
(V)GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
(V)Harper Co., H. M., 8200 Lehigh Ave., Morton Grove, Ill.
(V)INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 266, 267.
(V)J F D MFG. CO., 6101-23 Sixteenth Ave., Brooklyn, N. Y. ADV. PG. 254, 264.
(V)Judd Co., H. L., 87 Chambers St., New York 7, N. Y.
(V)Naughton Co., Thomas, 199 Fore, Portland, Me.
(V)Locke Incorporated, P. O. Box 57, Baltimore 3, Md.
(V)National Screw & Mfg. Co., The, Cleveland 4, Ohio.
(V)Republic Steel Corp., Republic Bldg., Cleveland 1, Ohio.
(V)Schott Co., Walter L., 9306 Santa Monica Blvd., Beverly Hills, Calif.
(V)Smith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.
(V)Stronghold Screw Products, Inc., 216-222 West Hubbard St., Chicago 10, Ill.
(V)United Screw & Bolt Corp., 2513 W. Cullerton St., Chicago 8, Ill.

BOLTS—*Toggle*

(V)Ackerman-Johnson Co., 625 W. Jackson Blvd., Chicago 6, Ill.
(V)Arro Expansion Bolt Co., Boone Ave., Marion, Ohio.
(V)Chicago Expansion Bolt Co., 1338 W. Concord Pl., Chicago 22, Ill.
(V)FEDERAL SCREW PRODUCTS INC., 224 W. Huron St., Chicago 10, Ill. ADV. PG. 271.
(V)GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
(V)Greene Mfg. Corp., G. G., Warren, Pa.
(V)J F D MFG. CO., 6101-23 Sixteenth Ave., Brooklyn, N. Y. ADV. PG. 254, 264.
(V)Locke Incorporated, P. O. Box 57, Baltimore 3, Md.
(V)National Screw & Mfg. Co., Cleveland 4, Ohio.
(V)Smith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.
(V)Star Expanslen Products Co., 147-149 Cedar St., New York 6, N. Y.

BOOKS

See Technical Books—Publishers

BOOMS—*Microphone*

(V)Atlas Sound Corp., 1443 39th St., Brooklyn 18, N. Y.
(V)AVIOMETER DIV. of Roanwell Corp., 662 Pacific St., Brooklyn 17, N. Y. ADV. PG. 66.

1950-1951 DIRECTORY of

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

Ⓥ Hersh Radio, Inc., 7317 Beverly Blvd., Los Angeles 36, Calif.
Ⓥ Hiram Co., Ohio K., 1534 Cahuenga, Hollywood 28, Calif.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
Ⓥ Sentinel Products Co., 7115 Brookville Rd., P. O. Box 413, Silver Spring, Md.

BOOSTERS—*Television*

Ⓥ Amitor Radio Corp., 2215 South St., Chicago 23, Ill.
Ⓥ Atlantic Corp., The, Conneaut, Ohio.
Ⓥ Bud Radio, Inc., 2118 E. 55th St., Cleveland 3, Ohio.
Ⓥ ELECTRO-VOICE, INC., Buchanan, Mich. ADV. PG. 196.
Ⓥ I. D. E. A., 55 North New Jersey, Indianapolis, Ind.
Ⓥ M. S. Electronics, Inc., 622 E. 6th St., New York, N. Y.
Ⓥ STANDARD COIL PRODUCTS CO., 2329 N. Pulaski Rd., Chicago 39, Ill. ADV. PG. 233.
Ⓥ Transvision Inc., 440 North Ave., New Rochelle, N. Y.
Ⓥ TURNER CO., THE, 909 17th St., N. E., Cedar Rapids, Iowa. ADV. Pg. 54.

BOXES—*Metal*

Ⓥ ART LLOYD METAL PRODUCTS CORP., 2473 Cropsey Ave., Brooklyn 14, N. Y. ADV. PG. 272.
Ⓥ Bud Radio, Inc., 2118 E. 55th St., Cleveland 3, Ohio.
Ⓥ Cabinet Mfg. Corp., Lindenhurst, L. I., N. Y. — Columbia Metal Box Co., 260 E. 161st St., New York, N. Y.
Ⓥ Craft Mfg. Co., 1948 W. Schubert St., Chicago, Ill.
Ⓥ Cutler Metal Products Co., Camden, N. J.
Ⓥ Donnelly Electric & Mfg. Co., 3050 Washington St., Boston, Mass.
Ⓥ Doolittle Radio, Inc., 7421 S. Loomis Blvd., Chicago 36, Ill.
Ⓥ Gates Radio Co., Quincy, Ill.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Gregory Mfg. Corp., S. S., Warren, Pa.
Ⓥ Hallett Mfg. Co., 1601 Florence Ave., Inglewood, Calif.
Ⓥ INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
Ⓥ KARP METAL PRODUCTS CO., INC., 215 63rd St., Brooklyn 20, N. Y. ADV. PG. 51.
Ⓥ Kay & Blum Mfg. Co., 2893 Spring Grove Ave., Cincinnati 25, Ohio.
Ⓥ Kelton Electric Mfg. Co., 225 New Jersey Railroad Ave., Newark 5, N. J.
La Mayna Mfg. Co., Inc., East Rutherford, N. J.
Ⓥ Minute Man Products, Inc., 509 E. 22nd St., New York 10, N. Y.
Ⓥ MULTI METAL WIRE CLOTH CO., INC., 1350 Garrison Ave., New York 59, N. Y. ADV. PG. 66.
Ⓥ OLYMPIC METAL PRODUCTS CO., INC., Philipsburg, N. J. ADV. PG. 148.
Pierce Template Corp., 2646 N. Coral St., Philadelphia 25, Pa.
REF Mfg. Corp., Jericho Turnpike, Mineola, N. Y.
Sperling Metal Specialties, 31 Columbia Ave., Brooklyn 2, N. Y.
Ⓥ Walter Co., Inc., S., 1400 Atlantic Ave., Brooklyn 16, N. Y.
Ⓥ Worcester Pressed Aluminum Corp., 11-15 Hope Ave., Worcester, Mass.

BOXES—*Waterproof*

Ⓥ ART LLOYD METAL PRODUCTS CORP., 2473 Cropsey Ave., Brooklyn 14, N. Y. ADV. PG. 272.
Ⓥ Bracth Mfg. Corp., 200 Central Ave., Newark 4, N. J.
Ⓥ Craft Mfg. Co., 1948 W. Schubert St., Chicago, Ill.
Ⓥ Cutler Metal Products Co., Camden, N. J.
Ⓥ Donnelly Electric & Mfg. Co., 3050 Washington St., Boston, Mass.
Ⓥ Gates Radio Co., Quincy, Ill.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Hallett Mfg. Co., 1601 Florence Ave., Inglewood, Calif.
Hose McCann Telephone Co., Inc., 25th St. & 3rd Ave., Brooklyn 32, N. Y.
Ⓥ KARP METAL PRODUCTS CO., INC., 215 63rd St., Brooklyn 20, N. Y. ADV. PG. 51.
Ⓥ Kay & Blum Mfg. Co., 2893 Spring Grove Ave., Cincinnati 25, Ohio.
La Mayna Mfg. Co., Inc., East Rutherford, N. J.
Market Forge Co., Everett 49, Mass.
Ⓥ MULTI METAL WIRE CLOTH CO., INC., 1350 Garrison Ave., New York 59, N. Y. ADV. PG. 66.
Plastic Accessories, Inc., 93 Mercer St., New York 12, N. Y.
Prinzcraft Inc., 95 Mercer St., New York, N. Y.
REF Mfg. Corp., Jericho Turnpike, Mineola, N. Y.
Ⓥ Skydome Inc., River Rd., Port Jervis, N. Y.
Ⓥ Walter Co., Inc., S., 1400 Atlantic Ave., Brooklyn 16, N. Y.

BRACKETS

Ⓥ Adalin Stamping Co., 1923 Nebraska Ave., Toledo 7, Ohio.
Ⓥ Bud Radio, Inc., 2118 E. 55th St., Cleveland 3, Ohio.
Ⓥ CAMBRIDGE THERMIONIC CORP., 445 Concord Ave., Cambridge, Mass. ADV. PG. 72.
Ⓥ CINCH MFG. CORP., 1026 S. Homan Ave., Chicago 24, Ill. ADV. PG. 154.
Ⓥ Citation Products Co., 233 E. 146th St., New York 51, N. Y.
Cole Winders, Inc., 61 Bergen St., Brooklyn 2, N. Y.
Ⓥ Cole Heroes Co., 20 Old Colony Ave., Boston 27, Mass.
Ⓥ Colgate Mfg. Corp., Lindenhurst, L. I., N. Y.
Ⓥ Donnelly Electric & Mfg. Co., 3050 Washington St., Boston, Mass.
Ⓥ Doolittle Radio, Inc., 7421 S. Loomis Blvd., Chicago 36, Ill.
Ⓥ Eastern Specialty Corp., Philadelphia 40, Pa.
Ⓥ FALSTROM CO., 44 Fallstrom Court, Passaic, N. J. ADV. PG. 262.
Ⓥ FEDERAL SCREW PRODUCTS, INC., 224 W. Huron St., Chicago 10, Ill. ADV. PG. 271.
Ⓥ Frankel Mfg. Corp., A. W., 43-20 34th St., Long Island City 1, N. Y.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Hallett Mfg. Co., 1601 Florence Ave., Inglewood, Calif.
Ⓥ Industrial Precision Products Co., 215-235 N. Hoyne Ave., Chicago 12, Ill.
Ⓥ INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
Ⓥ Kay & Blum Mfg. Co., 2893 Spring Grove Ave., Cincinnati 25, Ohio.
Kling Metal Spinning Co., 174 Centre St., New York 13, N. Y.
La Mayna Mfg. Co., Inc., East Rutherford, N. J.
Ⓥ Locke Incorporated, P. O. Box 57, Baltimore 3, Md.
Ⓥ Minute Man Products, Inc., 509 E. 22nd St., New York 10, N. Y.
Ⓥ MULTI METAL WIRE CLOTH CO., INC., 1350 Garrison Ave., New York 59, N. Y. ADV. PG. 66.
Ⓥ Network Mfg. Corp., Bayonne, N. J.
Ⓥ OLYMPIC METAL PRODUCTS CO., INC., Philipsburg, N. J. ADV. PG. 148.
Pierce Template Corp., 2646 N. Coral St., Philadelphia 25, Pa.
Ⓥ Plastimold Corp., Attleboro, Mass.
Ⓥ Premier Products Div., Chisholm-Ryder Co., Inc., Niagara Falls 2, N. Y.
Ⓥ Smith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.
South River Metal Products Co., South River, N. J.
Ⓥ Walter Co., Inc., S., 1400 Atlantic Ave., Brooklyn 16, N. Y.
Ⓥ Wind Turbine Co., Tower & Antenna Div., E. Market St. & Penna R. R., West Chester, Pa.

BRACKETS—*f-m & Television Antenna*

Ⓥ AEROLITE ELECTRONIC HARDWARE CORP., 507 26th St., Union City, N. J. ADV. PG. 134.
Ⓥ AMERICAN PHENOLIC CORPORATION, 1830 S. 54th Ave., Chicago 50, Ill. ADV. PG. 241.
Ⓥ Bracth Mfg. Corp., 200 Central Ave., Newark 4, N. J.
Ⓥ Bud Radio, Inc., 2118 E. 55th St., Cleveland 3, Ohio.
Ⓥ Jampton, Inc., 32-40 57th St., Woodside, N. Y.
Ⓥ Citation Products Co., 233 E. 146th St., New York 51, N. Y.
Cole Heroes Co., 20 Old Colony Ave., Boston 27, Mass.
Ⓥ Donnelly Electric & Mfg. Co., 3050 Washington St., Boston, Mass.
Ⓥ Hands Brothers, Plainfield, N. J.
Ⓥ Hy-Lite Antennae Inc., 1060 Washington Blvd., Bronx 56, N. Y.
Ⓥ Industrial Precision Products Co., 215-325 N. Hoyne Ave., Chicago 12, Ill.
Ⓥ INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
Ⓥ J. F. D. MFG. CO., 6101-23 Sixteenth Ave., Brooklyn, N. Y. ADV. PG. 264, 264.
La Mayna Mfg. Co., Inc., East Rutherford, N. J.
Ⓥ MULTI METAL WIRE CLOTH CO., INC., 1350 Garrison Ave., New York 59, N. Y.
National Electronic Mfg. Corp., 35-05 36th St., Long Island City, N. Y.
Ⓥ Oak Ridge Products Mfg. Div. of Video Television Inc., 239 E. 127th St., New York 35, N. Y.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Premier Products Div., Chisholm-Ryder Co., Inc., Niagara Falls 2, N. Y.
Ⓥ Product Development Co., Inc., Arlington, N. J.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
Ⓥ TECHNICAL APPLIANCE CORP., Sherburne, N. Y. ADV. PG. 281.
Ⓥ Telex, Inc., Box 879, Pittsfield & Nestow Highway, Ashbury Park, N. J.
Viker Corp., 7400 Hurge River Drive, Dexter, Mich.
Ⓥ Walter Co., Inc., S., 1400 Atlantic Ave., Brooklyn 16, N. Y.
Ⓥ Ward Products Corp., Div. of the Gabriel Co., 1523 E. 45th St., Cleveland 3, Ohio.
Warren Mfg. Co., Inc., 250 East St., New Haven, Conn.
Ⓥ Wind Turbine Co., Tower & Antenna Div., E. Market St. & Penna R. R., West Chester, Pa.

BREAKERS—*Circuit*

Ⓥ Electric Auto-Lite Co., The, Toledo 1, Ohio.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ HEINEMANN ELECTRIC CO., 97 Hum St., Trenton 2, N. J. ADV. PG. 224.
Ⓥ I-T-E CIRCUIT BREAKER CO., 19th & Hamilton Sts., Philadelphia 30, Pa. ADV. PG. 40, 41.
Ⓥ Kelton Electric Mfg. Co., 123 New Jersey Railroad Ave., Newark 5, N. J.
Ⓥ LITTELFUSE, INC., 4757 Ravenswood Ave., Chicago 40, Ill. ADV. PG. 164.
Ⓥ Roller-Smith, Bethlehem, Pa.
Ⓥ RUSSELL & STOLL CO., INC., 125 Barclay St., New York 7, N. Y. ADV. PG. 211.
Ⓥ Spencer Thermostat Co., 34 Forest St., Attleboro, Mass.
Ⓥ Thumbull Electric Mfg. Co., Plainville, Conn.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

BRIDGES—*Capacitance*

Ⓥ Aerovox Corp., 740 Belleville Ave., New Bedford, Mass.
Ⓥ BROWN ELECTRO-MEASUREMENT CORP., 4637 SE Hawthorne Blvd., Portland 15, Oregon. ADV. PG. 276.
Ⓥ Clough-Brengle Co., 6014 N. Broadway, Chicago, Ill.
Ⓥ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ CORNELL-DUBILIER ELECTRIC CORP., South Plainfield, N. J. ADV. PG. 70.
Ⓥ ELECTRONIC INSTRUMENT CO., INC., 276 Newport St., Brooklyn 12, N. Y. ADV. PG. 274.
Ⓥ FREED TRANSFORMER CO., INC., 1736 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 143.
Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Ⓥ HEATH CO., Benton Harbor, Mich. ADV. PG. 279.
Ⓥ Industrial Instruments Inc., 17 Pollack Ave., Jersey City 5, N. J.
Ⓥ Jackson Electrical Instrument Co., 16 S. Patterson Blvd., Dayton 1, Ohio.
Ⓥ Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
Ⓥ Marconi Instruments, Ltd., 23 Beaver St., New York 4, N. Y.
Ⓥ MEASUREMENTS CORP., Boonton, N. J. ADV. PG. 145.
Metropolitan Electronics & Instruments Co., 106 Fifth Ave., New York 11, N. Y.
Ⓥ MUIRHEAD & CO., LTD., Beckenham-Kent-England. ADV. PG. 71.
Ⓥ Simpson Electric Co., Div. American Gage & Machine Co., 5208 W. Kinzie St., Chicago 44, Ill.
Ⓥ Southwestern Electronic Co., 2831 Post Oak Rd., Houston 19, Texas.
Ⓥ Sprague Electric Co., North Adams, Mass.
Ⓥ SYLVANIA ELECTRIC PRODUCTS INC., Emporium, Pa. N. Y. ADV. PG. 266 to 270.
Tech Laboratories Inc., Bergen & Edsall Blvds., Palisades Park, N. J.
Technology Instrument Corp., 1058 Main St., Waltham 54, Mass.

BRIDGES—*Electrical*

Applied Science Corp. of Princeton, The, P. O. Box 44, Princeton, N. J.
Ⓥ Associated Research, Inc., 3758 W. Belmont, Chicago 18, Ill.
Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ BROWN ELECTRO-MEASUREMENT CORP., 4637 SE Hawthorne Blvd., Portland 15, Oregon. ADV. PG. 276.
Ⓥ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ Connor (Canada) Ltd., 301-303 Windsor St., Halifax, N. S., Canada.
Electronic Brazing Co., 140 Glenridge Ave., Montclair, N. J.
Ⓥ FREED TRANSFORMER CO., INC., 1736 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 143.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Ⓥ Industrial Instruments, Inc., 17 Pollack Ave., Jersey City 5, N. J.
Ⓥ Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
McMurdo Silver Co., Inc., 1240 Main St., Hartford 3, Conn.
Ⓥ Marconi Instruments Ltd., 23 Beaver St., New York 4, N. Y.
Ⓥ MEASUREMENTS CORP., Boonton, N. J. ADV. PG. 145.
Metropolitan Electronics & Instruments Co., 106 Fifth Ave., New York 11, N. Y.
Ⓥ MUIRHEAD & CO., LTD., Beckenham-Kent-England. ADV. PG. 71.

Ⓥ Indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

Radio City Prods. Co., Inc., 152 W. 25th St., New York 1, N. Y.
Reiner Electronics Co., 152 W. 25th Street, New York, N. Y.
Rubicon Co., 3761 Ridge Ave., Phila. Pa.
SHALLCROSS MFG. CO., 10 Jackson Ave., Collingdale, Pa. ADV. PG. 221.
Southwestern Industrial Electronic Co., 2831 Post Oak Rd., Houston 14, Texas.
SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.
Tech Laboratories, Inc., Bergen & Edsall Blvds., Palisades Park, N. J.
Technology Instrument Corp., 1058 Main St., Waltham 54, Mass.
WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

BRIDGES—*Temperature*

Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.

BRIDGES—*Thermistor*

BRADLEY LABS., INC., 92 Meadow St., New Haven 10, Conn. ADV. PG. 152.
GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
HEWLETT-PACKARD CO., 395 Page Mill Rd., Palo Alto, Calif. ADV. PG. 68, 69.
JONES ELECTRONICS CO., M. C., Bristol, Conn. ADV. PG. 138.
POLYTECHNIC RESEARCH & DEVELOPMENT CO., INC., 202 Tillary St., Brooklyn 1, N. Y. ADV. PG. 56, 57.
Pulin Co., 2070 N. Fair Oaks Ave., Pasadena 3, Calif.
Tech Laboratories, Inc., Bergen & Edsall Blvds., Palisades Park, N. J.

BROADCAST INPUT CONTROL EQUIPMENT

Altec Lansing Corp., 161 Avenue of the Americas, New York 13, N. Y.
American Communications Corp., 306 Broadway, New York 7, N. Y.
Arlington Electric Products, Inc., 600 W. 52nd St., New York 19, N. Y.
Collins Radio Co., Cedar Rapids, Iowa.
Haven Co., 191 Central Ave., Newark 4, N. J.
Fairchild Recording Equipment Corp., 154th St. & 7th Avenue, Whitestone, N. Y.
Gates Radio Co., Quincy, Ill.
GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
Radio Music Corp., Port Chester, N. Y.
RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 237.
REEVES-HOFFMAN CORP., 321 Cherry St., Carlisle, Pa. ADV. PG. 32.
Standard Telephones & Cables Ltd., Connaught House, Aldych, London, W. C. 2, England.
SUPERIOR ELECTRIC CO., THE, 83 Meadow St., Bristol, Conn. ADV. PG. 110, 111.
Tech Laboratories, Inc., Bergen & Edsall Blvds., Palisades Park, N. J.
Thordarson Electric Mfg. Div., Maguire Industries Inc., 500 W. Huron St., Chicago 10, Ill.
U. S. W. Machine Products Inc., Electronics Div., 5151 St. Clair Ave., Cleveland 3, Ohio.

BRUSHES—*Carbon & Graphite*

Electro-Nite Carbon Co., 1139 E. Columbia Ave., Philadelphia 25, Pa.
GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 223.
GRAPHITE METALLIZING CORP., 1041 Nepperhan Ave., Yonkers 3, N. Y. ADV. PG. 76.
Helwig Co., 2544 N. 30th St., Milwaukee 10, Wis.
KEYSTONE CARBON CO., INC., Saint Marys, Pa. ADV. PG. 42.
Pure Carbon Co., St. Marys, Pa.
St. Marys Carbon Co., State Road, St. Marys, Pa.
Seager Carbon Co., 289 Church St., New York 13, N. Y.
Speer Carbon Co., Lincoln Ave., St. Marys, Pa.
STACKPOLE CARBON CO., St. Marys, Pa. ADV. PG. 166, 167.
U. S. Graphite Co., Saginaw, Mich.
WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

BRUSHES—*Metal-Graphite*

GRAPHITE METALLIZING CORP., 1041 Nepperhan Ave., Yonkers 3, N. Y. ADV. PG. 76.
Helwig Co., 2544 N. 30th St., Milwaukee, Wis.
International Powder Metallurgy Co., 439 Main St., Ridgway, Pa.
KEYSTONE CARBON CO., INC., Saint Marys, Pa. ADV. PG. 42.
Pure Carbon Co., St. Marys, Pa.
St. Marys Carbon Co., State Road, St. Marys, Pa.
Seager Carbon Co., 289 Church St., New York 13, N. Y.
Speer Carbon Co., Lincoln Ave., St. Marys, Pa.
STACKPOLE CARBON CO., St. Marys, Pa. ADV. PG. 166, 167.
U. S. Graphite Co., Saginaw, Mich.

BUS BAR SYSTEMS

Federal Electric Products Co., 50 Paris St., Newark, N. J.
GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Kolton Electric Mfg. Co., 123 New Jersey Railroad Ave., Newark 5, N. J.
Trumbull Electric Mfg. Co., Plainville, Conn.
WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

BUS BARS—*Solderless*

Chase Brass & Copper Co., Inc., Waterbury 91, Conn.
GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Kolton Electric Mfg. Co., 123 New Jersey Railroad Ave., Newark 5, N. J.
WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

BUSHINGS—*Hermetically Sealed*

AMERICAN LAVA CORP., Chattanooga 5, Tenn. ADV. PG. 27.
CORNING GLASS WORKS, Corning, N. Y. ADV. PG. 134.
ELECTRICAL INDUSTRIES, INC., 44 Summer Ave., Newark 4, N. J. ADV. PG. 217.
ELECTRO-SEAL CORP., 946 Lee St., DesPlaines, Ill. ADV. PG. 90.
GENERAL CERAMICS & STEATITE CORP., Keasbey, N. J. ADV. PG. 219.
Heldor Bushing & Terminal Co., Inc., P. O. Box 91, Orange, N. J.
HERMASEAL CO., INC., Riverside Drive, Elkhart, Ind. ADV. PG. 264.
HERMETIC SEAL PRODUCTS CO., 29-37 So. 6th St., Newark 7, N. J. ADV. PG. 87.
Locke Incorporated, P. O. Box 57, Baltimore 3, Md.
STUPAKOFF CERAMIC & MFG. CO., Latrobe, Pa. ADV. PG. 147.
WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

BUSHINGS—*Nonmetallic*

AMERICAN LAVA CORP., Chattanooga 5, Tenn. ADV. PG. 27.
ATLANTIC INDIA RUBBER WORKS, INC., 571 W. Polk St., Chicago 7, Ill. ADV. PG. 271.
Beach Precision Parts Co., Boonton, N. J.
BIWAX CORP., 3445 Howard St., Skokie, Ill. ADV. PG. 242.
Brandywine Fibre Co., 15th & Poplar Sts., Wilmington, Del.
Citation Products Co., 233 E. 146th St., New York 51, N. Y.
Continental Diamond Fibre Co., 16 Chapel St., Newark 16, Delaware.
CORNING GLASS WORKS, Corning, N. Y. ADV. PG. 134.
GENERAL CERAMICS & STEATITE CORP., Keasbey, N. J. ADV. PG. 219.
GRAPHITE METALLIZING CORP., 1041 Nepperhan Ave., Yonkers 3, N. Y. ADV. PG. 76.
Heldor Bushing & Terminal Co., Inc., P. O. Box 91, Orange, N. J.
HEYMAN MFG. CO., 300 Michigan Ave., Kenilworth, N. J. ADV. PG. 26.
INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
Kirchberger & Co., Inc., M., 1425 37th St., Brooklyn 18, N. Y.
Laconia Corp., 37 S. 6th St., Newark 7, N. J.
Lamicoid Fabrications, Inc., 4545 W. Cortland St., Chicago 39, Ill.
Lawton Mfg. Co., East Liverpool, Ohio.
MYCALEX CORP. OF AMERICA, 60 Clifton Blvd., Clifton, N. J. ADV. PG. 169.
NATIONAL CARBON DIVISION, Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y. ADV. PG. 109.
NATIONAL VULCANIZED FIBRE CO., Wilmington, Del. ADV. PG. 183.
Printoid Inc., 95 Mercer St., New York, N. Y.
Pure Carbon Co., St. Marys, Pa.
RICHARDSON CO., THE, 2767 Lake St., Melrose Park, Ill. ADV. PG. 144.
Spaulding Fibre Co., Inc., 310 Wheeler St., Tonawanda, N. Y.
STUPAKOFF CERAMIC & MFG. CO., Latrobe, Pa. ADV. PG. 147.
Waterbury Companies Inc., Waterbury 90, Conn.
WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

CABINETS

See Also Housings

CABINETS—*Metal*

Acklin Stamping Co., 1923 Nebraska Ave., Toledo 7, Ohio.
Altec Lansing Corp., 161 Avenue of the Americas, New York 13, N. Y.
ART-LLOYD METAL PRODUCTS CORP., 2973 Cropsey Ave., Brooklyn 14, N. Y. ADV. PG. 232.
BUCK ENGINEERING CO., 37-41 Marcy St., Freehold, N. J. ADV. PG. 194.
Bud Radio Inc., 2118 E. 55th St., Cleveland 3, Ohio.
Collins Radio Co., Cedar Rapids, Iowa.
Columbia Metal Box Co., 260 E. 143rd St., New York, N. Y.
Croname, Inc., 3701 Ravenswood Ave., Chicago, Ill.
Cutler Metal Products Co., Camden, N. J.
Donnelly Electric & Mfg. Co., 3050 Washington St., Boston, Mass.
Doolittle Radio, Inc., 7421 S. Loomis Blvd., Chicago 41, Ill.
FALSTROM CO., 44 Falstrom Court, Passaic, N. J. ADV. PG. 162.
Gates Radio Co., Quincy, Ill.
Grammes & Sons, Inc., L. F., 289 Union St., Allentown 2, Pa.
Gray Mfg. Co., The, 16 Arbor St., Hartford, Conn.
Greene Mfg. Corp., G. G., Warren, Pa.
HEATH CO., Benton Harbor, Mich. ADV. PG. 279.
INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
Intervox Corp., 2701 California Ave., Seattle 6, Wash.
Johnson Co., E. F., Waseca, Minn.
KARP METAL PRODUCTS CO., INC., 215 63rd St., Brooklyn 20, N. Y. ADV. PG. 53.
Kirk & Blum Mfg. Co., 2893 Spring Grove Ave., Cincinnati 25, Ohio.
Kolton Electric Mfg. Co., 123 New Jersey Railroad Ave., Newark 5, N. J.
LaRose & Associates, W. T., 646 Second Ave., Troy, N. Y.
Lyman Electronic Corp., 12 Cass St., Springfield, Mass.
McMunn Silver Co., Inc., 1240 Main St., Hartford 3, Conn.
Market Forge Co., Everett 49, Mass.
Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.
MULTI METAL WIRE CLOTH CO., INC., 1350 Garrison Ave., New York 59, N. Y. ADV. PG. 66.
NATIONAL CO., INC., 61 Sherman St., Malden 48, Mass. ADV. PG. 33 to 36.
Northeastern Engineering, Inc., Manchester, N. H.
OLYMPIC METAL PRODUCTS CO., INC., Phillipsburg, N. J. ADV. PG. 148.
PAR-METAL PRODUCTS CORP., 32-62 49th St., Long Island City 3, N. Y. ADV. PG. 242.
Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Pierce Template Corp., 2646 N. Coral St., Philadelphia 25, Pa.
Press Wireless Mfg. Co., Inc., Cantiague Rd., Hicksville, L. I., N. Y.
RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
REF Mfg. Corp., Jericho Turnpike, Mineola, N. Y.
Republic Steel Corp., Republic Bldg., Cleveland 1, Ohio.
Ripley Co., Inc., P. O. Box 31, Middletown, Conn.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Walter Co., Inc., S., 1400 Atlantic Ave., Bronklyn 16, N. Y.

CABINETS—*Plastic*

Arc Radio Corp., 523 Myrtle Ave., Brooklyn, N. Y.
Boonton Molding Co., Boonton, N. J.
Calbest Engineering & Electronics Co., 828 N. Highland Ave., Hollywood 38, Calif.
Catalin Corp. of America, 1 Park Ave., New York 16, N. Y.
Chicago Die Mold Mfg. Co., 4001 Wrightwood Ave., Chicago 39, Ill.
Consolidated Molded Products Corp., Scranton 2, Pa.
Fetterolf & Sons, Inc., G., 4100 W. Grand Ave., Chicago 51, Ill.
Kuhn & Jacob Molding & Tool Co., 1200 Southard St., Trenton, N. J.
Mack Molding Co., Wayne, N. J.
Molded Insulation Co., Aircraft Control Div., 335 E. Price St., Philadelphia, Pa.
Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Plastic Accessories, Inc., 93 Mercer St., New York 12, N. Y.
Plastimold Corp., Attleboro, Mass.

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

Hollister, Inc., 91 Mercer St., New York, N. Y.
Ⓥ Kester Co., 1610 - 1101 Bryant St., San Francisco 10, Calif.
Ⓥ RICHARDSON CO., THE, 2787 Lake St., Melrose Park (9), ADV. PG. 164.
Sprague Engineering Co., Inc., 101 S. Clinton St., Syracuse 1, N. Y.
Ⓥ Waterbury Components, Inc., Waterbury 90, Conn.

CABINETS—*Wood*

Ⓥ Admiral Corp., 3800 Cortland St., Chicago 39.
Ansley Products Co., Inc., 370 53rd St., Brooklyn 32, N. Y.
Ⓥ Atlas Sporting Corp., 161 Avenue of the Americas, New York 13, N. Y.
American Communications Corp., 306 Broadway, New York 7, N. Y.
Arc Radio Corp., 521 Myrtle Ave., Brooklyn, N. Y.
Ⓥ Bogen Co., Inc., David, 663 Broadway, New York 12, N. Y.
Cabinwood Mfg. Co., 12th & Burnett Sts., Louisville 6, Ky.
Elk Laboratories, 16 S. Broadway, Dobbs Ferry, N. Y.
Ⓥ Gates Radio Co., Quincy, Ill.
Hartley Co., Ltd., H. A., 152 Hammersmith Rd., London W. 14, England.
Ⓥ Hallicrafters, The, 4401 W. Fifth Ave., Chicago 24, Ill.
Ⓥ Jackson Industries, Inc., 66 E. Gordon St., Ottawa, Ohio.
Ⓥ Magnavox Co., The, 2131 Bueter Rd., Fort Wayne 6, Ind.
Ⓥ Majestic Electronics, Inc., 3757-11 W. Jefferson, Los Angeles 16, Calif.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Rauland-Borg Corp., 3450 W. Addison St., Chicago 18, Ill.
Ⓥ Setchell-Carlson, Inc., 1421 Mississippi, St. Paul 4, Minn.
Ⓥ Stewart-Warner Corp., 1826 Diversey Pkwy., Chicago 14, Ill.
Ⓥ Stromberg-Carlson Co., 100 Carlson Rd., Rochester 3, N. Y.
Ⓥ Sturdy Mfg. Co., 60 Benton Ave., San Francisco 10, Calif.
Ⓥ Transvision, Inc., 460 North Ave., New Rochelle, N. Y.
United Wood Specialty Mfg. Co., Inc., 851 Broadway, Fall River, Mass.
Ⓥ Universal Corporation, 425 Bush St., San Francisco 8, Calif.
Ⓥ Webster-Chicago Corp., Charlotte, Michigan.

CABLE ASSEMBLIES

Ⓥ AEROLITE ELECTRONIC HARDWARE CO., 567 26th St., Union City, N. J., ADV. PG. 136.
American Communications Corp., 306 Broadway, New York 7, N. Y.
Ⓥ BAKER & WILLIAMSON, 240 Fairfield Ave., Upper Darby, Pa., ADV. PG. 169.
Ⓥ Bunnell & Co., H. M., 326 Station St., Plush, Ohio.
Ⓥ Cardwell Condenser Corp., 77 Shirley St., Boston 19, Mass.
Ⓥ Carol Cable Co., 140 Middle St., Pawtucket, R. I.
Ⓥ Chicago Products Co., 244 S. Leavitt St., Chicago 12, Ill.
Ⓥ Cinch Manufacturing Corp., 1026 S. Homan Ave., Chicago 24, Ill., ADV. PG. 169.
Ⓥ Communication Products Co., Inc., 61 Broadway, New York 6, N. Y.
Ⓥ Connecticut Telephone & Electric Div., Great American Industries, Inc., 70 Britannia St., Meriden, Conn.
Ⓥ Dielectric Materials Co., 5315-17 N. Ravenswood Ave., Chicago 40, Ill.
Ⓥ Dumont Radio, Inc., 7421 S. Loomis Blvd., Chicago 36, Ill.
Ⓥ Electric Specialty Co., Philadelphia 40, Pa.
Ⓥ ELECTRO WIRE SERVICE, 5 Beekman St., New York 7, N. Y., ADV. PG. 249.
Englewood Electronic Supply Co., 6901 S. Halsted St., Chicago 21, Ill.
Ⓥ Essex Wire Corp., 1601 Wall St., Fort Wayne 6, Ind.
Ⓥ Fenwal Mfg. Co., Inc., Woods Chapel Rd., Framingham, Mass.
Ⓥ Franklin Mfg. Corp., A. W., 43-20 34th St., Long Island City 1, N. Y.
Ⓥ GENERAL ELECTRIC CO., Construction Materials Dept., 1285 Boston Ave., Bridgeport 2, Conn., ADV. PG. 18.
Ⓥ Gremar Mfg. Co., Inc., 410 Bridge St., Wakefield, Mass.
Ⓥ Hallett Mfg. Co., 2602 Florence Ave., Inglewood, Calif.
Ⓥ Hamilton Electronics Co., Hanover, Mass.
Ⓥ LENZ ELECTRIC MFG. CO., 1751 North Western Ave., Chicago 47, Ill., ADV. PG. 122.
Lenz Electronics Corp., The, 1 Lenz Pl., New York 53, N. Y.
Mallory Mfg. Div., Mallory-Indiana Inc., Mt. Carmel, Ind.
Ⓥ Meissner Manufacturing Co., Mt. Carmel, Ill.
Ⓥ Mitchell Specialties Co., Aircraft Control Div., 435 N. Broad St., Philadelphia, Pa.
Ⓥ PHALO PLASTICS CORP., 29 Foster St., Worcester 8, Mass., ADV. PG. 212.
Ⓥ Plastoid Corp., 10 Mill Rd., Hamburg, N. J.
Ⓥ Product Development Co., Inc., Arlington, N. J.
Ⓥ Radiation Counter Laboratories, Inc., 1944 W. 21st St., Chicago 8, Ill.
Raytheon Mfg. Co., Waltham, Mass.
Ⓥ Rex Rheostat Co., Hagerstown, Md.
Superior Electronics Corp., 1260 Flushing Ave., Brooklyn 37, N. Y.
Star Measurements Co., 442 E. 166th St., New York 56, N. Y.
Tensolite Corp., The, 7 Hudson St., N. Tarrytown, N. Y.
Ⓥ Whitaker Cable Corp., Kansas City 16, Mo.
Ⓥ Z & W Machine Products Inc., Electronics Div., 6152 St. Clair Ave., Cleveland 3, Ohio.

CABLE HOOKS

Ⓥ CINCH MFG. CORP., 1026 S. Homan Ave., Chicago 24, Ill., ADV. PG. 169.
Ⓥ GENERAL ELECTRIC CO., Construction Materials Dept., 1285 Boston Ave., Bridgeport 2, Conn., ADV. PG. 5 to 18.
Ⓥ Industrial Precision Products Co., 315-325 N. Hoyne Ave., Chicago 12, Ill.
Ⓥ Kellogg Switchboard & Supply Co., 6650 S. Cicero Ave., Chicago 38, Ill.
Ⓥ Kingsley Co., Thomas, 199 Fore, Portland, Me.
Ⓥ Locke Incorporated, P. O. Box 57, Baltimore 3, Md.

CABLE—*Coaxial Flexible*

Ⓥ AMTON INC., 161 E. Elizabeth Ave., Linden, N. J., ADV. PG. 46.
Alpha Wire Corp., 50 Howard St., New York, N. Y.
Ⓥ AMERICAN PHENOLIC CORPORATION, 1830 S. 54th Ave., Chicago 50, Ill., ADV. PG. 191.
Ⓥ American Steel & Wire Co., U. S. Steel Corp. Subs., Rockefeller Bldg., Cleveland 13, Ohio.
Ⓥ Anchor Plastics Co., Inc., 533-541 Canal St., New York 13, N. Y.
Ⓥ Andrew Corp., 363 East 75th St., Chicago 19, Ill.
Ⓥ Anaconda Electrical Co., 63 Main St., Ansonia, Conn.
Ⓥ Belden Mfg. Co., 4647 W. Van Buren St., Chicago 44, Ill.
Ⓥ BOSTON INSULATED WIRE & CABLE CO., 61 Bay St., Boston 25, Mass., ADV. PG. 157.
Ⓥ BRAND & CO., WM., Willimantic, Conn., ADV. PG. 120, 121.
Ⓥ Carol Cable Co., 140 Middle St., Pawtucket, R. I.
Ⓥ Chase Brass & Copper Co., Inc., Waterbury 91, Conn.
Ⓥ Chester Cable Corp., Chester, N. Y.
Ⓥ Columbia Wire & Supply Co., 2850 Irving Park Rd., Chicago 18, Ill.
Ⓥ Communication Products Co., Inc., Broadway & Clark St., Keyport, N. J.
Ⓥ Consolidated Wire & Associated Companies, 1635 S. Clinton St., Chicago 16, Ill.
Ⓥ Essex (Canada) Ltd., 301-303 Windsor St., Halifax, N. S., Canada.
Ⓥ Dielectric Materials Co., 5315-17 N. Ravenswood Ave., Chicago 40, Ill.
Ⓥ FEDERAL TELEPHONE AND RADIO CORP., 100 Kingsland Rd., Clifton, N. J., ADV. PG. 23 to 25.
Ⓥ Gates Radio Co., Quincy, Ill.
Ⓥ General Cable Corp., 420 Lexington Ave., New York 17, N. Y.
Ⓥ General Insulated Wire Works, Inc., 69 Gordon Ave., Providence 6, R. I.
Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass., ADV. PG. 48, 49.
Ⓥ J. F. D. MFG. CO., 4101-23 Sixteenth Ave., Brooklyn 4, N. Y., ADV. PG. 254, 264.
Ⓥ Lewyn Co., F. F., Warren, Minn.
Ⓥ LENZ ELECTRIC MFG. CO., 1751 North Western Ave., Chicago 47, Ill., ADV. PG. 122.
Ⓥ Lenzite Co., Canal St., Passaic, N. J.
Ⓥ PHALO PLASTICS CORP., 29 Foster St., Worcester 8, Mass., ADV. PG. 212.
Ⓥ Phelps Dodge Copper Products Corp., 40 Wall Street, New York 5, N. Y.
Ⓥ Plastoid Corp., 10 Mill Rd., Hamburg, N. J.
Product Development Co., Inc., Arlington, N. J.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J., ADV. PG. 73 to 75, Inside Back and Back Covers.
Ⓥ Simplex Wire & Cable Co., 79 Sidney St., Cambridge 39, Mass.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ SURPRENANT MFG. CO., 199 Washington St., Boston 11, Mass., ADV. PG. 229.
Tensolite Corp., The, 7 Hudson St., N. Tarrytown, N. Y.
Ⓥ Transradio Ltd., 138A Crownwell Rd., London SW 7, England.
Ⓥ Uniform Tubes, Shurs Lane & Lansdowne St., Roxborough, Philadelphia, Pa.
Ⓥ Varian Associates, 611 Hansen Way, Palo Alto, Calif.
Weymouth Instrument Co., 1440 Commercial St., East Weymouth 89, Mass.
Ⓥ Whitney Blake Co., New Haven, Conn.

CABLE—*Coaxial Rigid*

Ⓥ Alpha Wire Corp., 50 Howard St., New York, N. Y.
Ⓥ Anchor Plastics Co., Inc., 533-541 Canal St., New York 13, N. Y.
Ⓥ Andrew Corp., 363 E. 75th St., Chicago 19, Ill.
Ⓥ BRAND & CO., WM., Willimantic, Conn., ADV. PG. 120, 121.
Ⓥ Carol Cable Co., 140 Middle St., Pawtucket, R. I.
Ⓥ Chase Brass & Copper Co., Inc., Waterbury 91, Conn.
Ⓥ Columbia Wire & Supply Co., 2850 Irving Park Rd., Chicago 18, Ill.
Ⓥ Communication Products Co., Inc., Broadway & Clark Street, Keyport, N. J.
Ⓥ Consolidated Wire & Associated Companies, 1635 S. Clinton St., Chicago 16, Ill.
Ⓥ Essex (Canada) Ltd., 301-303 Windsor St., Halifax, N. S., Canada.
Ⓥ Dielectric Materials Co., 5315-17 N. Ravenswood Ave., Chicago 40, Ill.
Ⓥ Electric Auto-Lite Co., Toledo 1, Ohio.
Ⓥ Essex Wire Corp., 1601 Wall St., Fort Wayne 6, Ind.
Ⓥ FEDERAL TELEPHONE AND RADIO CORP., 100 Kingsland Rd., Clifton, N. J., ADV. PG. 23 to 25.
Ⓥ General Cable Corp., 420 Lexington Ave., New York 17, N. Y.
Ⓥ GENERAL ELECTRIC CO., Construction Materials Dept., 1285 Boston Ave., Bridgeport 2, Conn., ADV. PG. 5 to 18.
Ⓥ General Insulated Wire Works, Inc., 69 Gordon Ave., Providence 6, R. I.
Goldmark Wire Co., James, The, 75 Murray St., New York 7, N. Y.
Ⓥ Hazard Insulated Wire Works, Div., The Okonite Co., Wilkes Barre, Pa.
Ⓥ J. F. D. MFG. CO., 4101-23 Sixteenth Ave., Brooklyn 4, N. Y., ADV. PG. 254, 264.
Ⓥ Kellogg Switchboard & Supply Co., 6650 S. Cicero Ave., Chicago 38, Ill.
Ⓥ LENZ ELECTRIC MFG. CO., 1751 North Western Ave., Chicago 47, Ill., ADV. PG. 122.
Ⓥ New England Electrical Works, Lisbon, N. H.
Ⓥ Lenzite Co., Canal St., Passaic, N. J.
Ⓥ PHALO PLASTICS CORP., 29 Foster St., Worcester 8, Mass., ADV. PG. 212.
Ⓥ Phelps Dodge Copper Products Corp., 40 Wall St., New York 5, N. Y.
Ⓥ Plastic Wire & Cable Corp., Jewett City, Conn.
Ⓥ Plastoid Corp., 10 Mill Rd., Hamburg, N. J.
Ⓥ Product Development Co., Inc., Arlington, N. J.
Ⓥ Rockbestos Products Corp., 308 Nicoll St., New Haven 4, Conn.
Selectar Industries, Inc., 401 E. 138th St., New York 54, N. Y.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ Uniform Tubes, Shurs Lane & Lansdowne St., Roxborough, Philadelphia, Pa.
Ⓥ Varian Associates, 611 Hansen Way, Palo Alto, Calif.
Weymouth Instrument Co., 1440 Commercial St., East Weymouth 89, Mass.

CABLE—*Insulated*

Ⓥ ALDEN PRODUCTS CO., 117 No. Main St., Brockton 64, Mass., ADV. PG. 235.
Ⓥ Alliance Mfg. Co., Lake Park Blvd., Alliance, Ohio.
Ⓥ Alpha Wire Corp., 50 Howard St., New York, N. Y.
Ⓥ American Electric Cable Co., 161 Appleton St., Holyoke, Mass.
Ⓥ AMERICAN PHENOLIC CORPORATION, 1830 S. 54th Ave., Chicago 50, Ill., ADV. PG. 191.
Ⓥ American Steel & Wire Co., U. S. Steel Corp. Subs., Rockefeller Bldg., Cleveland 13, Ohio.
Ⓥ Anaconda Wire & Cable Co., 25 Broadway, New York 4, N. Y.
Ⓥ Anaconda Electrical Co., 63 Main St., Ansonia, Conn.
Ⓥ Belden Mfg. Co., 4647 W. Van Buren St., Chicago 44, Ill.
Birnbach Radio Co., Inc., 145 Hudson St., New York, N. Y.
Ⓥ BOSTON INSULATED WIRE & CABLE CO., 61 Bay St., Boston 25, Mass., ADV. PG. 157.
Ⓥ BRAND & CO., WM., Willimantic, Conn., ADV. PG. 120, 121.
Ⓥ Carol Cable Co., 140 Middle St., Pawtucket, R. I.
Ⓥ Chase Brass & Copper Co., Inc., Waterbury 91, Conn.
Ⓥ Chester Cable Corp., Chester, N. Y.
Ⓥ Collyer Insulated Wire Co., 249 Roosevelt Ave., Pawtucket, R. I.
Ⓥ Columbia Wire & Supply Co., 2850 Irving Park Rd., Chicago 18, Ill.
Ⓥ Consolidated Wire & Associated Companies, 1635 S. Clinton St., Chicago 16, Ill.
Ⓥ CORNISH WIRE CO., 15 Park Row, New York 7, N. Y., ADV. PG. 140.
Ⓥ Essex (Canada) Ltd., 301-303 Windsor St., Halifax, N. S., Canada.
Ⓥ Dielectric Materials Co., 5315-17 N. Ravenswood Ave., Chicago 40, Ill.
Ⓥ Electric Auto-Lite Co., Toledo 1, Ohio.
Ⓥ Essex Wire Corp., 1601 Wall St., Fort Wayne 6, Ind.
Ⓥ FEDERAL TELEPHONE AND RADIO CORP., 100 Kingsland Rd., Clifton, N. J., ADV. PG. 23 to 25.
Ⓥ General Cable Corp., 420 Lexington Ave., New York 17, N. Y.
Ⓥ GENERAL ELECTRIC CO., Construction Materials Dept., 1285 Boston Ave., Bridgeport 2, Conn., ADV. PG. 5 to 18.
Ⓥ General Insulated Wire Works, Inc., 69 Gordon Ave., Providence 6, R. I.
Goldmark Wire Co., James, The, 75 Murray St., New York 7, N. Y.
Ⓥ Hazard Insulated Wire Works, Div., The Okonite Co., Wilkes Barre, Pa.
Ⓥ J. F. D. MFG. CO., 4101-23 Sixteenth Ave., Brooklyn 4, N. Y., ADV. PG. 254, 264.
Ⓥ Kellogg Switchboard & Supply Co., 6650 S. Cicero Ave., Chicago 38, Ill.
Ⓥ LENZ ELECTRIC MFG. CO., 1751 North Western Ave., Chicago 47, Ill., ADV. PG. 122.
Ⓥ New England Electrical Works, Lisbon, N. H.
Ⓥ Lenzite Co., Canal St., Passaic, N. J.
Ⓥ PHALO PLASTICS CORP., 29 Foster St., Worcester 8, Mass., ADV. PG. 212.
Ⓥ Phelps Dodge Copper Products Corp., 40 Wall St., New York 5, N. Y.
Ⓥ Plastic Wire & Cable Corp., Jewett City, Conn.
Ⓥ Plastoid Corp., 10 Mill Rd., Hamburg, N. J.
Ⓥ Product Development Co., Inc., Arlington, N. J.
Ⓥ Rockbestos Products Corp., 308 Nicoll St., New Haven 4, Conn.
ROME CABLE CORP., 330 Ridge St., Rome, N. Y., ADV. PG. 182.
Ⓥ Simplex Wire & Cable Co., 79 Sidney St., Cambridge 39, Mass.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ SURPRENANT MFG. CO., 199 Washington St., Boston 11, Mass., ADV. PG. 229.
Tensolite Corp., The, 7 Hudson St., N. Tarrytown, N. Y.
Ⓥ U. S. Rubber Co., 1230 Avenue of the Americas, New York 20, N. Y.
Ⓥ Western Insulated Wire Co., 2421 E. 30th St., Los Angeles, Calif.
Ⓥ Whitney Blake Co., New Haven, Conn.

V indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

CABLE—*Microphone*

V Alpha Wire Corp., 50 Howard St., New York, N. Y.
V American Electric Cable Co., 181 Appleton St., Holyoke, Mass.
V **AMERICAN PHENOLIC CORPORATION**, 1830 S. 54th Ave., Chicago 50, Ill. ADV. PG. 191.
V American Steel & Wire Co., U. S. Steel Corp. Subs., Rockefeller Bldg., Cleveland 13, Ohio.
V Anaconda Wire & Cable Co., 25 Broadway, New York 4, N. Y.
V Belden Mfg. Co., 4647 W. Van Buren St., Chicago 44, Ill.
Birnbach Radio Co., Inc., 145 Hudson St., New York, N. Y.
V **BOSTON INSULATED WIRE & CABLE CO.**, 63 Bay St., Boston 25, Mass. ADV. PG. 157.
V **BRAND & CO., WM.**, Willimantic, Conn. ADV. PG. 120, 121.
V Carol Cable Co., 190 Middle St., Pawtucket, R. I.
V Chester Cable Corp., Chester, N. Y.
V Collins Radio Co., Cedar Rapids, Iowa.
V Columbia Wire & Supply Co., 2850 Irving Park Rd., Chicago 18, Ill.
V Consolidated Wire & Associated Companies, 1635 S. Clinton St., Chicago 16, Ill.
V **CORNISH WIRE CO.**, 15 Park Row, New York 7, N. Y. ADV. PG. 140.
V Cossor (Canada) Ltd., 301-303 Windsor St., Halifax, N. S., Canada.
V Dielectric Materials Co., 5315-17 N. Ravenswood Ave., Chicago 40, Ill.
V Essex Wire Corp., 1601 Wall St., Fort Wayne 6, Ind.
V **FEDERAL TELEPHONE & RADIO CORP.**, 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.
V General Cable Corp., 420 Lexington Ave., New York 17, N. Y.
V General Insulated Wire Works, Inc., 69 Gordon Ave., Providence 5, R. I.
Goldmark Wire Co., James, The, 75 Murray St., New York 7, N. Y.
V Hazard Insulated Wire Works, Div., The, Okonite Co., Wilkes-Barre, Pa.
V **J F D MFG. CO.**, 6101-23 Sixteenth Ave., Brooklyn, N. Y. ADV. PG. 254, 264.
V **LENZ ELECTRIC MFG. CO.**, 1751 North Western Ave., Chicago 47, Ill. ADV. PG. 122.
V Okonite Co., Canal St., Passaic, N. J.
V **PHALO PLASTICS CORP.**, 25 Foster St., Worcester 8, Mass. ADV. PG. 212.
V Phelps Dodge Copper Products Corp., 40 Wall St., New York 5, N. Y.
V Plastic Wire & Cable Corp., Jewett City, Conn.
V Plastoid Corp., 10 Mill Rd., Hamburg, N. J.
V **RADIO CORP. OF AMERICA**, RCA Victor Div., general offices, Camden, N. J. ADV. PG. 73 to 75. Inside Back and Back Covers.
V Roebling's Sons Co., John A., 640 Broad St., Trenton 2, N. J.
V **ROME CABLE CORP.**, 330 Ridge St., Rome, N. Y. ADV. PG. 131.
V Simplex Wire & Cable Co., 79 Sidney St., Cambridge 39, Mass.
V Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
V **SURPRENANT MFG. CO.**, 199 Washington St., Boston 10, Mass. ADV. PG. 229.
Tensolite Corp., The, 7 Hudson St., N. Tarrytown, N. Y.
V U. S. Rubber Co., 1230 Avenue of the Americas, New York 20, N. Y.
V Western Insulated Wire Co., 2421 E. 30th St., Los Angeles, Calif.
V Whitney Blake Co., New Haven, Conn.

CABLE—*Shielded*

V AEROLITE ELECTRONIC HARDWARE CORP., 507 26th St., Union City, N. J. ADV. PG. 138.
V **ALDEN PRODUCTS CO.**, 117 No. Main St., Brockton 64, Mass. ADV. PG. 235.
V Alpha Wire Corp., 50 Howard St., New York, N. Y.
V American Electric Cable Co., 181 Appleton St., Holyoke, Mass.
V **AMERICAN PHENOLIC CORPORATION**, 1830 S. 54th Ave., Chicago 50, Ill. ADV. PG. 191.
V American Steel & Wire Co., U. S. Steel Corp. Subs., Rockefeller Bldg., Cleveland 13, Ohio.
V Anaconda Wire & Cable Co., 25 Broadway, New York 4, N. Y.
V Ansonia Electrical Co., 63 Main St., Ansonia, Conn.
V Belden Mfg. Co., 4647 W. Van Buren St., Chicago 44, Ill.
Birnbach Radio Co., Inc., 145 Hudson St., New York, N. Y.
V **BOSTON INSULATED WIRE & CABLE CO.**, 63 Bay St., Boston 25, Mass. ADV. PG. 157.
V **BRAND & CO., WM.**, Willimantic, Conn. ADV. PG. 120, 121.
V Carol Cable Co., 190 Middle St., Pawtucket, R. I.
V Chase Brass & Copper Co., Inc., Waterbury 91, Conn.
V Chester Cable Corp., Chester, N. Y.
V Calver Insulated Wire Co., 249 Roosevelt Ave., Pawtucket, R. I.
V Columbia Wire & Supply Co., 2850 Irving Park Rd., Chicago 18, Ill.
V Consolidated Wire & Associated Companies, 1635 S. Clinton St., Chicago 16, Ill.
V **CORNISH WIRE CO.**, 15 Park Row, New York 7, N. Y. ADV. PG. 140.
V Cossor (Canada) Ltd., 301-303 Windsor St., Halifax, N. S., Canada.
V Dielectric Materials Co., 5315-17 N. Ravenswood Ave., Chicago 40, Ill.
V Essex Wire Corp., 1601 Wall St., Fort Wayne 6, Ind.
V **FEDERAL TELEPHONE & RADIO CORP.**, 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.
V General Cable Corp., 420 Lexington Ave., New York 17, N. Y.
V General Insulated Wire Works, Inc., 69 Gordon Ave., Providence 5, R. I.
V **GENERAL ELECTRIC CO.**, Construction Materials Dept., 1285 Boston Ave., Bridgeport 2, Conn. ADV. PG. 5 to 18.
V General Insulated Wire Works, Inc., 69 Gordon Ave., Providence 5, R. I.
V **J F D MFG. CO.**, 6101-23 Sixteenth Ave., Brooklyn, N. Y. ADV. PG. 254, 264.
V Jefferson Co., E. F., Waseca, Minn.
V Kellogg Switchboard & Supply Co., 6650 S. Cicero Ave., Chicago 38, Ill.
V LaPointe-Plascomold Corp., Unionville, Conn.
V **LENZ ELECTRIC MFG. CO.**, 1751 North Western Ave., Chicago 47, Ill. ADV. PG. 122.
V **PHALO PLASTICS CORP.**, 25 Foster St., Worcester 8, Mass. ADV. PG. 212.
V Phelps Dodge Copper Products Corp., 40 Wall Street, New York 5, N. Y.
V Plastoid Corp., 10 Mill Rd., Hamburg, N. J.
V Product Development Co., Inc., Arlington, N. J.
V **RADIO CORP. OF AMERICA**, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75. Inside Back and Back Covers.
V Rockbestos Products Corp., 308 Nicoll St., New Haven 4, Conn.
V **ROME CABLE CORP.**, 330 Ridge St., Rome, N. Y. ADV. PG. 131.
Selectar Industries, Inc., 401 E. 138th St., New York 54, N. Y.
V Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
V **TECHNICAL APPLIANCE CORP.**, Sherburne, N. Y. ADV. PG. 201.
V Transradio Ltd., 138A Cromwell Rd., London S. W. 7, England.
V U. S. Rubber Co., 1230 Avenue of the Americas, New York 20, N. Y.

CABLE—*uhf*

V **AMERICAN PHENOLIC CORPORATION**, 1830 S. 54th Ave., Chicago 50, Ill. ADV. PG. 191.
V Anaconda Wire & Cable Co., 25 Broadway, New York 4, N. Y.
V Andrew Corp., 363 E. 75th St., Chicago 19, Ill.
V Belden Mfg. Co., 4647 W. Van Buren St., Chicago 44, Ill.
Birnbach Radio Co., Inc., 145 Hudson St., New York, N. Y.
V **BOSTON INSULATED WIRE & CABLE CO.**, 63 Bay St., Boston 25, Mass. ADV. PG. 157.
V Chester Cable Corp., Chester, N. Y.
V Columbia Wire & Supply Co., 2850 Irving Park Rd., Chicago 18, Ill.
V Communication Products Co., Inc., Broadway & Clark St., Keyport, N. J.
V Cossor (Canada) Ltd., 301-303 Windsor St., Halifax, N. S., Canada.
V Dielectric Materials Co., 5315-17 N. Ravenswood Ave., Chicago 40, Ill.
V **FEDERAL TELEPHONE AND RADIO CORP.**, 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.
V General Cable Corp., 420 Lexington Ave., New York 17, N. Y.
V General Insulated Wire Works, Inc., 69 Gordon Ave., Providence 5, R. I.
V **GENERAL RADIO CO.**, 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
V **PHALO PLASTICS CORP.**, 25 Foster St., Worcester 8, Mass. ADV. PG. 212.
V Plastic Wire & Cable Corp., Jewett City, Conn.
V Product Development Co., Inc., Arlington, N. J.
V Rockbestos Products Corp., 308 Nicoll St., New Haven 4, Conn.
V Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.

CALIBRATORS—*Sweep*

Applied Science Corp. of Princeton, The, P. O. Box 44, Princeton, N. J.
V **BROWNING LABORATORIES, INC.**, 750 Main St., Winchester, Mass. ADV. PG. 30.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
V Canoga Corp., 14315 Bessemer St., P. O. Box 361, Van Nuys, Calif.
V Clarkstan Corp., 11927 SW. Pico Blvd., Los Angeles 64, Calif.
Coastwise Electronics Corp., Inc., 130 N. Beaudry Ave., Los Angeles, Calif.
V Feiler Engineering Co., 1601 S. Federal St., Chicago 16, Ill.
V **KAY ELECTRIC CO.**, 14 Maple Ave., Pine Brook, N. J. ADV. PG. 193.
V Manufacturers Engr. & Equip. Corp., Willow Grove, Pa.
V Owen Laboratories, 9130 Orion St., San Fernando, Calif.
V **RADIO CORP. OF AMERICA**, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75. Inside Back and Back Covers.
Ripley Co., Inc., P. O. Box 31, Middletown, Conn.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
V Tech Laboratories, Inc., Bergen & Edsall Blvds., Palisades Park, N. J.

CALIBRATORS—*uhf*

V Feiler Engineering Co., 1601 S. Federal St., Chicago 16, Ill.
V Ferris Instrument Co., 110 Cornelia St., Boonton, N. J.
V **KAY ELECTRIC CO.**, 14 Maple Ave., Pine Brook, N. J. ADV. PG. 193.
V **LAVOIE LABORATORIES**, Morganville, N. J. ADV. PG. 151.
V Manufacturers Thread Grinding Inc., P. O. Box 66, Eatontown, N. J.

V indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

V MEASUREMENTS CORP., Boonton, N. J. ADV. PG. 195.
V Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
V POLYTECHNIC RESEARCH & DEVELOPMENT CO. INC., 202 Tillary St., Brooklyn 1, N. Y. ADV. PG. 58, 59.
V Premier Crystal Lab., Inc., 79-89 Seventh Ave., New York 11, N. Y.
V SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.

CAMERAS—*Cathode Ray Oscillograph*

American British Technology, Inc., 57 Park Ave., New York 16, N. Y.
V Baldwin Locomotive Works, Philadelphia 42, Pa.
V Commercial Research Labs., Inc., 29 Bartlett Ave., Detroit 3, Mich.
V Fisher (Canada) Ltd., 801-803 Windsor St., Halifax, N. S., Canada.
V Du Mont Laboratories, Inc., Allen B., Television Transmitter Div., 1000 Main Ave., Clifton, N. J.
V Electro-Medical Lab., Inc., Hollston, Mass.
V Electrodyne Company, 37 Oliver St., Boston, Mass.
V Fairchild Camera & Instrument Corp., 88-06 Van Wyck Blvd., Jamaica 1, N. Y.
V Flight Research Engineering Corp., P. O. Box 1-F, Richmond 1, Va.
V GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 68, 69.
V HEILAND RESEARCH CORP., 130 E. 5th Ave., Denver 9, Colo. ADV. PG. 242.
V Hycon Instruments, 60 Greenpoint Ave., Brooklyn 22, N. Y.
V Southwestern Industrial Electronic Co., 2631 Fort Oak Rd., Houston 19, Texas.
V VECTRON, INC., 235 High St., Waltham, Mass. ADV. PG. 268.
V Warrick, Frederick P., 1940 Grosfield Rd., Bidding, Ham, Mich.
V Z & W Machine Products Inc., Electronics Div., 5171 St. Clair Ave., Cleveland 3, Ohio.

CAMERAS—*Radar Recording*

V Communication Measurements Lab., Inc., 120 Greenwich St., New York, N. Y.
V Flight Research Engineering Corp., P. O. Box 1-F, Richmond 1, Va.
V Mauser, Inc., J. A., 37-01 31st St., Long Island City, N. Y.
V Photographic Products, Inc., 915 N. Mansfield Ave., Hollywood 38, Calif.

CAMERAS—*Television*

V Du Mont Laboratories, Inc., Allen B., Television Transmitter Div., 1000 Main Ave., Clifton, N. J.
V GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 19.
Jamaica Television Mfg. Co., 99-06 Sutphin Blvd., Jamaica 4, N. Y.
V Mauser, Inc., J. A., 37-01 31st St., Long Island City, N. Y.
V Polarad Electronics Corp., 100 Metropolitan Ave., Brooklyn 11, N. Y.
V RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 74 to 79. Inside Back and Back Covers.
V Television Equipment Corp., 338 William St., New York 7, N. Y.
Television Projects, Inc., 3140 Coral Way, Miami 34, Fla.

CAMERAS—*X Ray*

V Fairchild Camera & Instrument Corp., 88-06 Van Wyck Blvd., Jamaica 1, N. Y.
V General Electric X-Ray Corp., 4855 W. McGeoch Ave., Milwaukee, Wis.
V North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
St. Joseph X-Ray Laboratory, Calipso, N. J.
V WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

CANS

V ART WIRE & STAMPING CO., 225 High St., Newark 2, N. J. ADV. PG. 189.
V Colgate Mfg. Corp., Lindenhurst, L. I., N. Y.
V Craft Mfg. Co., 5449 W. Schubert St., Chicago, Ill.
V ELECTRO SEAL CORP., 446 Lee St., Des Plaines, Ill. ADV. PG. 90.
V FALSTROM CO., 44 Falstrom Court, Passaic, N. J. ADV. PG. 162.
V Gorrell Mfg. Corp., G. G., Warren, Pa.
Guttman Inc., Edwin J., 155 Throop St., Chicago, Ill.
V Heldor Bushing & Terminal Co., Inc., P. O. Box 91, Orange, N. J.
V Kirk & Blum Mfg. Co., 2893 Spring Grove Ave., Cincinnati 25, Ohio.
V LOJACK PRECISION CORP., 261 Worth St., New York 13, N. Y. ADV. PG. 261.
V Milan Mfg. Co., James, 150 Exchange St., Malden, Mass.
V MULTI METAL WIRE CLOTH CO., INC., 1359 Garrison Ave., New York 59, N. Y. ADV. PG. 66.
V OLYMPIC METAL PRODUCTS CO., INC., Phillipsburg, N. J. ADV. PG. 148.
V Paul & Beekman Inc., 1001 Cortland St., Philadelphia 40, Pa.
V Research Co., Paul R., 641 E. 61st St., Los Angeles 1, Calif.
Vokar Corp., 7300 Huron River Drive, Dexter, Mich.
V Walter Co., Inc., S., 1400 Atlantic Ave., Brooklyn 16, N. Y.
V Worcester Pressed Aluminum Corp., 13-15 Hope Ave., Worcester 3, Mass.

CANS—*Hermetically Sealed*

Coil Winders, Inc., 61 Bergen St., Brooklyn 2, N. Y.
V Craft Mfg. Co., 5449 W. Schubert St., Chicago, Ill.
V ELECTRICAL INDUSTRIES, INC., 44 Sumner Ave., Newark 4, N. J. ADV. PG. 217.
V ELECTRO-SEAL CORP., 446 Lee St., Des Plaines, Ill. ADV. PG. 90.
V Heldor Bushing & Terminal Co., Inc., P. O. Box 91, Orange, N. J.
HERMASEAL CO., INC., Riverside Drive, Elkhart, Ind. ADV. PG. 264.

NOTE:
Throughout all capacitor listings
(h) indicates hermetically sealed types
(p) indicates pressure types
(v) indicates vacuum types

CAPACITORS—*Ceramic Fixed*

V Automatic Mfg. Corp., 65 Gouverneur St., Newark 4, N. J.
V Cardwell Mfg. Corp., Allen D., 97 Whiting St., Plainville, Conn.
V CENTRALAB DIV. of Globe-Union Inc., 900 E. Keefe Ave., Milwaukee 1, Wis. ADV. PG. 64, 65. (h)
V CORNELL-DUBILIER ELECTRIC CORP., South Plainfield, N. J. ADV. PG. 70. (h) (p) (v)
V ELECTRICAL REACTANCE CORP., Elm St., Franklinville, N. Y. ADV. PG. 28, 29.
V Electro Motive Mfg. Co., South Park & John Sts., Willimantic, Conn.
V ERIE RESISTOR CORP., 644 W. 12th St., Erie, Pa. ADV. PG. 47.
V GLENCO CORP., Matawan, N. J. ADV. PG. 192.
V Herrlec Corp., The, 422 N. Fifth St., Milwaukee 3, Wis. (h)
V Jeffers Electronics, Inc., Du Bois, Pa.
V Maida Development Co., 12 E. Howard St., Phoebus, Va.
V Mallory & Co., Inc., P. R., 3029 E. Washington St., Indianapolis 6, Ind.
Muter Co., 1255 S. Michigan Ave., Chicago, Ill.
V North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
V Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
V RADIO MATERIALS CORP., 3325 Belmont Ave., Chicago 13, Ill. ADV. PG. 206.
V Sangamo Electric Co., Springfield, Ill.
V Sprague Electric Co., North Adams, Mass. (h)
V Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
V Telegraph Condenser Co., Ltd., Wales Farm Rd., Acton, London, W. 3, England.
V Vitramon, Inc., Stepney, Conn.

CAPACITORS—*Ceramic Transmitting*

V Cardwell Mfg. Corp., Allen D., 97 Whiting St., Plainville, Conn.
V CENTRALAB DIV. of Globe-Union Inc., 900 E. Keefe Ave., Milwaukee 1, Wis. ADV. PG. 64, 65. (h)
V CORNELL-DUBILIER ELECTRIC CORP., South Plainfield, N. J. ADV. PG. 70. (h) (p) (v)
V ERIE RESISTOR CORP., 644 W. 12th St., Erie, Pa. ADV. PG. 47.
V Herrlec Corp., The, 422 N. Fifth St., Milwaukee 3, Wis. (h)
V Johnson Co., E. F., Waseca, Minn.
V Mallory & Co., Inc., P. R., 3029 E. Washington St., Indianapolis 6, Ind.
V North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
V Sangamo Electric Co., Springfield, Ill.
V Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
V Telegraph Condenser Co., Ltd., Wales Farm Rd., Acton, London, W. 3, England.

CAPACITORS—*Ceramic Trimmer*

V Automatic Mfg. Corp., 65 Gouverneur St., Newark 4, N. J.
V CENTRALAB DIV. of Globe-Union Inc., 900 E. Keefe Ave., Milwaukee 1, Wis. ADV. PG. 64, 65. (h)
V ELECTRICAL REACTANCE CORP., Elm St., Franklinville, N. Y. ADV. PG. 28, 29.
V Electro Motive Mfg. Co., South Park & John Sts., Willimantic, Conn.
V ERIE RESISTOR CORP., 644 W. 12th St., Erie, Pa. ADV. PG. 47.
Guttman Inc., Edwin J., 15 S. Throop St., Chicago, Ill.
V Herrlec Corp., The, 422 N. Fifth St., Milwaukee 3, Wis.
V Jeffers Electronics Inc., Du Bois, Pa.
V Maida Development Co., 12 E. Howard St., Phoebus, Va.
V Mallory & Co., Inc., P. R., 3029 E. Washington St., Indianapolis 6, Ind.
Muter Co., 1255 S. Michigan Ave., Chicago, Ill.
V North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
V Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
V Special Products Co., 9115 Brookville Rd., P. O. Box 471, Silver Spring, Md.
V STANDARD COIL PRODUCTS CO., 2329 N. Pulaski Rd., Chicago 39, Ill. ADV. PG. 233.
V STUPAKOFF CERAMIC & MFG. CO., Latrobe, Pa. ADV. PG. 147.
V Telegraph Condenser Co., Ltd., Wales Farm Rd., Acton, London, W. 3, England.
V Teleradio Engineering Corp., 99 Wall St., New York, N. Y.

CAPACITORS—*Electrolytic*

V Aerovox Corp., 740 Belleville Ave., New Bedford, Mass. (h)
American Condenser Co., 4410 Ravenswood Ave., Chicago 40, Ill. (h)
V CORNELL-DUBILIER ELECTRIC CORP., South Plainfield, N. J. ADV. PG. 70. (h) (p) (v)
Cosmic Radio Corp., 853 Whittier St., New York, N. Y.
Deutschmann Corp., Tobe, 921 Providence Highway, Norwood, Mass. (h)
V DUMONT ELECTRIC CO., 308 Dyckman St., New York, N. Y. ADV. PG. 228. (h) (p) (v)
V ILLINOIS CONDENSER CO., 1616 N. Throop St., Chicago, Ill. ADV. PG. 128.
V Industrial Condenser Corp., 3243 N. California Ave., Chicago 18, Ill.
V Magnavox Co., The, Components Div., Fort Wayne 4, Indiana.
V Mallory & Co., Inc., P. R., 3029 E. Washington Street, Indianapolis 6, Ind.
V Micamold Radio Corp., 1087 Flushing Ave., Brooklyn 6, N. Y.
V North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
V Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
V Planet Mfg. Corp., 225 Belleville Ave., Bloomfield, N. J. (h)
V Pyramid Electric Co., 155 Oxford St., Paterson, N. J.
V Sangamo Electric Co., Springfield, Illinois (h)
V Sprague Electric Co., North Adams, Mass. (h)
V Telegraph Condenser Co., Ltd., Wales Farm Rd., Acton, London, W. 3, England.

CAPACITORS—*Energy Storage*

V Aerovox Corp., 740 Belleville Ave., New Bedford, Mass. (h)
V CONDENSER PRODUCTS CO., 1375 N. Branch St., Chicago 22, Ill. ADV. PG. 213.
V CORNELL-DUBILIER ELECTRIC CORP., South Plainfield, N. J. ADV. PG. 70. (h) (p) (v)
Deutschmann Corp., Tobe, 921 Providence Highway, Norwood, Mass. (h)
V ELECTRONIC INSTRUMENT CO., INC., 276 Newport St., Brooklyn 12, N. Y. ADV. PG. 274.
V GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 19.
V Industrial Condenser Corp., 3243 N. California Ave., Chicago 18, Ill.
V North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
V Potter, 1950 Sheridan Rd., North Chicago, Ill. (h)
V Sprague Electric Co., North Adams, Mass. (h)
V Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
V Telegraph Condenser Co., Ltd., Wales Farm Rd., Acton, London, W. 3, England.
V UNITED CONDENSER CORP., 337 E. 139th St., New York 54, N. Y. ADV. PG. 236. (h)
V WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

CAPACITORS—*Fixed*

V Aerovox Corp., 740 Belleville Ave., New Bedford, Mass. (h)
American Condenser Co., 4410 Ravenswood Ave., Chicago 40, Ill. (h)
American Radionics Co., 33 Flatbush Ave., Brooklyn, N. Y.
V BROWN ELECTRO-MEASUREMENT CORP., 4617 SE Hawthorne Blvd., Portland 15, Ore. ADV. PG. 276.
V Bud Radio, Inc., 2118 E. 55th St., Cleveland 3, Ohio.
V Cardwell Mfg. Corp., Allen D., 97 Whiting St., Plainville, Conn.

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

Ⓥ CENTRALAB DIV. OF GLOBE UNION INC., 900 E. Keefe Ave., Milwaukee, Wis. ADV. PG. 64, 65. (h)
Ⓥ CONDENSER PRODUCTS CO., 1375 N. Branch St., Chicago 22, Ill. ADV. PG. 213.
Ⓥ CORNELL-DUBILIER ELECTRIC CORP., South Plainfield, N. J. ADV. PG. 70.
Ⓥ CORNING GLASS WORKS, Corning, N. Y. ADV. PG. 234.
Cosmic Radio Corp., 853 Whittier St., New York 59, N. Y.
Ⓥ Crown Capacitor Corp., Minot & Depot Sts., Wrentham, Mass.
Ⓥ Deutschmann Corp., Tobe, 921 Providence Highway, Norwood, Mass. (h)
Ⓥ DUMONT ELECTRIC CO., 308 Dyckman St., New York, N. Y. ADV. PG. 228. (h) (p) (v)
Ⓥ Eitel-McCullough, Inc., San Bruno, Calif. (x)
Ⓥ ELECTRICAL REACTANCE CORP., Elm St., Franklinville, N. Y. ADV. PG. 28, 29.
Ⓥ Electro Motive Mfg. Co., South Park & John St., Willimantic, Conn.
Ⓥ ERIE RESISTOR CORP., 644 W. 12th St., Erie, Pa. ADV. PG. 47.
Ⓥ Fast & Co., John E., 3101 N. Pulaski Rd., Chicago 41, Ill. (h)
Ⓥ Filtron Co., Inc., The, 38-25 Bell Blvd., Bayside, L. I., N. Y. (h)
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ GLENCO CORP., Metuchen, N. J. ADV. PG. 192.
Ⓥ ILLINOIS CONDENSER CO., 1616 N. Throop St., Chicago, Ill. ADV. PG. 128.
Ⓥ Industrial Condenser Corp., 3243 N. California Ave., Chicago 18, Ill. ADV. PG. 128. (h)
Ⓥ Jeffers Electronics Inc., DuBois, Pa.
Ⓥ JENNINGS RADIO MFG. CO., 1098 E. William St., San Jose 12, Calif. ADV. PG. 114, 115. (v)
Ⓥ Johnson Co., E. F., Waseca, Minn. (p)
Ⓥ Lapp Insulator Co., Inc., Radio Specialties Div., 31 Gilbert St., LeRoy, N. Y. (p) (v)
Ⓥ Maida Development Co., 12 E. Howard St., Pheobus, Va.
Ⓥ MEASUREMENTS CORP., Boonton, N. J. ADV. PG. 145.
Ⓥ Micamold Radio Corp., 1087 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Planet Mfg. Corp., 225 Belleville Ave., Bloomfield, N. J.
Ⓥ Potter Co., 1850 Sheridan Rd., No. Chicago, Ill. (h)
Ⓥ Pyramid Electric Co., 155 Oxford St., Paterson, N. J.
Ⓥ Sangamo Electric Co., Springfield, Ill. (h)
Ⓥ Sprague Electric Co., North Adams, Mass. (h)
Ⓥ STACKPOLE CARBON CO., St. Marys, Pa. ADV. PG. 166, 167.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ Telegraph Condenser Co., Ltd., Wales Farm Rd., Acton, London, W. 3, England.
Ⓥ UNITED CONDENSER CORP., 337 E. 139th St., New York 54, N. Y. ADV. PG. 236.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

CAPACITORS—*Fluid Variable*

Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ CONDENSER PRODUCTS CO., 1375 N. Branch St., Chicago 22, Ill. ADV. PG. 213.
Ⓥ Hammarlund Mfg. Co., 460 W. 34th St., New York 1, N. Y.

CAPACITORS—*Gas-filled*

Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ Johnson Co., E. F., Waseca, Minn.
Ⓥ Lapp Insulator Co., Inc., Radio Specialties Div., 31 Gilbert St., LeRoy, N. Y.

CAPACITORS—*Mica Fixed*

Ⓥ Aerovox Corp., 740 Belleville Ave., New Bedford, Mass. (h)
Ⓥ BROWN ELECTRO-MEASUREMENT CORP., 4637 SE Hawthorne Blvd., Portland 15, Oregon. ADV. PG. 226.
Ⓥ CORNELL-DUBILIER ELECTRIC CORP., South Plainfield, N. J. ADV. PG. 70. (h) (p) (v)
Ⓥ Electro Motive Mfg. Co., South Park & John St., Willimantic, Conn.
Ⓥ ERIE RESISTOR CORP., 644 W. 12th St., Erie, Pa. ADV. PG. 47.
Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Ⓥ Mallory & Co., Inc., P. R., 3029 E. Washington St., Indianapolis 6, Ind.
Ⓥ Micamold Radio Corp., 1087 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Plastics & Electronics Co., 272 Northland Ave., Buffalo 8, N. Y.
Ⓥ Sangamo Electric Co., Springfield, Illinois. (h)
Ⓥ Sprague Electric Co., North Adams, Mass. (h)
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ Telegraph Condenser Co., Ltd., Wales Farm Rd., Acton, London, W. 3, England.

CAPACITORS—*Mica Transmitting*

Ⓥ Aerovox Corp., 740 Belleville Ave., New Bedford, Mass. (h)
Ⓥ CORNELL-DUBILIER ELECTRIC CORP., South Plainfield, N. J. ADV. PG. 70. (h) (p) (v)
Ⓥ Mallory & Co., Inc., P. R., 3029 E. Washington St., Indianapolis 6, Ind.
Ⓥ North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
Ⓥ Sangamo Electric Co., Springfield, Ill. (h)
Ⓥ Sprague Electric Co., North Adams, Mass. (h)
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ Telegraph Condenser Co., Ltd., Wales Farm Rd., Acton, London, W. 3, England.
Ⓥ Teleradio Engineering Corp., 99 Wall St., New York, N. Y.

CAPACITORS—*Mica Trimmer*

Ⓥ Automatic Mfg. Corp., 65 Gouverneur St., Newark 4, N. J.
Ⓥ Electro Motive Mfg. Co., South Park & John St., Willimantic, Conn.
Guthman Inc., Edwin I., 15 S. Throop St., Chicago, Ill.
Meissner Mfg. Div., Maguire Industries, Inc., Mt. Carmel, Ill.
Ⓥ Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Teleradio Engineering Corp., 99 Wall St., New York, N. Y.

CAPACITORS—*Neutralizing*

Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ Bud Radio, Inc., 2118 E. 55th St., Cleveland 3, Ohio.
Ⓥ Cardwell Mfg. Co., Allen D., 97 Whiting St., Plainville, Conn.
Ⓥ JENNINGS RADIO MFG. CO., 1098 E. William St., San Jose 12, Calif. ADV. PG. 114, 115.
Ⓥ Johnson Co., E. F., Waseca, Minn.
Ⓥ Millen Mfg. Co., James, 150 Exchange St., Malden 48, Mass.
Ⓥ NATIONAL CO., INC., 61 Sherman St., Malden 48, Mass. ADV. PG. 33 to 36.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ Teleradio Engineering Corp., 99 Wall St., New York, N. Y.

CAPACITORS—*Oil Impregnated*

Ⓥ Aerovox Corp., 740 Belleville Ave., New Bedford, Mass. (h)
American Condenser Co., 4410 Ravenswood Ave., Chicago 40, Ill. (h)
American Radionics Co., 33 Flatbush Ave., Brooklyn, N. Y.
Ⓥ Astron Corp., 255 Grant Ave., East Newark, N. J. (h)
Ⓥ Chicago Condenser Corp., 3255 W. Armitage Ave., Chicago 47, Ill. (h) (p) (v)
Ⓥ CONDENSER PRODUCTS CO., 1375 N. Branch St., Chicago 22, Ill. ADV. PG. 213.
Ⓥ CORNELL-DUBILIER ELECTRIC CORP., South Plainfield, N. J. ADV. PG. 70.
Ⓥ Crown Capacitor Corp., Minot & Depot Sts., Wrentham, Mass.
Ⓥ Deutschmann Corp., Tobe, 921 Providence Highway, Norwood, Mass. (h)
Ⓥ Fast & Co., John E., 3101 N. Pulaski Rd., Chicago 41, Ill. (h)
Filtron Co., Inc., The, 38-25 Bell Blvd., Bayside, L. I., N. Y. (h) (v)
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Girard-Hopkins, 1000 40th Ave., Oakland 1, Calif.
Ⓥ Industrial Condenser Corp., 3243 N. California Ave., Chicago 18, Ill. (h)
Ⓥ Mallory & Co., Inc., P. R., 3029 E. Washington St., Indianapolis 6, Ind.
Ⓥ Micamold Radio Corp., 1087 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ Potter Co., 1850 Sheridan Rd., No. Chicago, Ill. (h)
Ⓥ Pyramid Electric Corp., 155 Oxford St., Paterson, N. J.
Ⓥ Sangamo Electric Co., Springfield, Ill. (h)
Ⓥ Sprague Electric Co., North Adams, Mass. (h)
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ Telegraph Condenser Co., Ltd., Wales Farm Rd., Acton, London, W. 3, England.
Ⓥ UNITED CONDENSER CORP., 337 E. 139th St., New York 54, N. Y. ADV. PG. 236.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

CAPACITORS—*Padder*

Ⓥ Automatic Mfg. Corp., 65 Gouverneur St., Newark 4, N. J.
Ⓥ Bud Radio Inc., 2118 E. 55th St., Cleveland 3, Ohio.
Ⓥ CENTRALAB DIV. of Globe-Union Inc., 900 E. Keefe Ave., Milwaukee 1, Wis. ADV. PG. 64, 65. (h)
Ⓥ Electro Motive Mfg. Co., South Park & John St., Willimantic, Conn.
Guthman Inc., Edwin I., 15 S. Throop St., Chicago, Ill.
Ⓥ JENNINGS RADIO MFG. CO., 1098 E. William St., San Jose 12, Calif. ADV. PG. 114, 115.
Meissner Mfg. Div., Maguire Industries, Inc., Mt. Carmel, Ill.
Ⓥ Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.
Ⓥ Molded Insulation Co., Aircraft Control Div., 335 E. Price St., Philadelphia, Pa.
Ⓥ NATIONAL CO., INC., 61 Sherman St., Malden 48, Mass. ADV. PG. 33 to 36.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Telegraph Condenser Co., Ltd., Wales Farm Rd., Acton, London, W. 3, England.
Ⓥ Teleradio Engineering Corp., 99 Wall St., New York, N. Y.

CAPACITORS—*Paper*

Ⓥ Aerovox Corp., 740 Belleville Ave., New Bedford, Mass. (h)
American Condenser Co., 4410 Ravenswood Ave., Chicago 40, Ill. (h)
American Radionics Co., 33 Flatbush Ave., Brooklyn, N. Y.
Ⓥ Astron Corp., 255 Grant Ave., East Newark, N. J. (h)
Ⓥ Chicago Condenser Corp., 3255 W. Armitage Ave., Chicago 47, Ill. (h) (p) (v)
Ⓥ CORNELL-DUBILIER ELECTRIC CORP., South Plainfield, N. J. (h) (p) (v)
Cosmic Radio Corp., 853 Whittier St., New York, N. Y.
Ⓥ Crown Capacitor Corp., Minot & Depot Sts., Wrentham, Mass.
Ⓥ Deutschmann Corp., Tobe, 921 Providence Highway, Norwood, Mass. (h)
Ⓥ Electro Motive Mfg. Co., South Park & John St., Willimantic, Conn.
Ⓥ Fast & Co., John E., 3101 N. Pulaski Rd., Chicago 41, Ill. (h)
Filtron Co., Inc., The, 38-25 Bell Blvd., Bayside, L. I., N. Y. (h) (v)
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Industrial Condenser Corp., 3243 N. California Ave., Chicago 18, Ill.
Ⓥ Mallory & Co., Inc., P. R., 3029 E. Washington St., Indianapolis 6, Ind.
Ⓥ Micamold Radio Corp., 1087 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Planet Mfg. Corp., 225 Belleville Ave., Bloomfield, N. J.
Ⓥ Potter Co., 1850 Sheridan Rd., North Chicago, Ill. (h)
Ⓥ Pyramid Electric Co., 155 Oxford St., Paterson, N. J.
Ⓥ Sangamo Electric Co., Springfield, Ill. (h)
Ⓥ Sprague Electric Co., North Adams, Mass. (h)
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ Telegraph Condenser Co., Ltd., Wales Farm Rd., Acton, London, W. 3, England.
Ⓥ UNITED CONDENSER CORP., 337 E. 139th St., New York 54, N. Y. ADV. PG. 236. (h)
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

CAPACITORS—*Plastic Dielectric*

Ⓥ Aerovox Corp., 740 Belleville Ave., New Bedford, Mass. (h)
Ⓥ Aircraft-Marine Products, Inc., 1523 N. Fourth St., Harrisburg, Pa.
Ⓥ CONDENSER PRODUCTS CO., 1375 N. Branch St., Chicago 22, Ill. ADV. PG. 213.
Ⓥ Crown Capacitor Corp., Minot & Depot Sts., Wrentham, Mass.
Ⓥ Deutschmann Corp., Tobe, 921 Providence Highway, Norwood, Mass. (h)
Ⓥ DUMONT ELECTRIC CO., 308 Dyckman St., New York, N. Y. ADV. PG. 228. (h) (p) (v)
Ⓥ ERIE RESISTOR CORP., 644 W. 12th St., Erie, Pa. ADV. PG. 47.
Ⓥ Fast & Co., John E., 3101 N. Pulaski Rd., Chicago 41, Ill. (h)
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Industrial Condenser Corp., 3243 N. California Ave., Chicago 18, Ill.
Ⓥ Micamold Radio Corp., 1087 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Plastics & Electronics Co., 272 Northland Ave., Buffalo 8, N. Y.
Ⓥ Potter Co., 1850 Sheridan Rd., No. Chicago, Ill. (h)
Ⓥ Sprague Electric Co., North Adams, Mass. (h)
Ⓥ Telegraph Condenser Co., Ltd., Wales Farm Rd., Acton, London, W. 3, England.

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

Ⓥ Televadio Engineering Corp., 99 Wall St., New York, N. Y.
Ⓥ UNITED CONDENSER CORP., 337 E. 139th St., New York 54, N. Y. ADV. PG. 236. (h)

CAPACITORS—*Plastic Trimmer*

Ⓥ Automatic Mfg. Corp., 65 Gouverneur St., Newark 4, N. J.
Ⓥ ERIE RESISTOR CORP., 644 W. 12th St., Erie, Pa. ADV. PG. 47.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ STACKPOLE CARBON CO., St. Marys, Pa. ADV. PG. 166, 167.

CAPACITORS—*Power Factor*

Ⓥ Aerovox Corp., 740 Belleville Ave., New Bedford, Mass. (h)
Ⓥ CENTRALAB DIV. of Globe Union Inc., 900 E. Keefe Ave., Milwaukee, Wis. ADV. PG. 64, 65. (h)
Ⓥ CONDENSER PRODUCTS CO., 1375 N. Branch St., Chicago 22, Ill. ADV. PG. 213.
Ⓥ CORNELL DUBILIER ELECTRIC CORP., South Plainfield, N. J. ADV. PG. 70.
Ⓥ Deutschmann Corp., Tobe, 921 Providence Highway, Norwood, Mass. (h)
Ⓥ Fast & Co., John E., 3101 N. Pulaski Rd., Chicago 41, Ill. (h)
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Industrial Condenser Corp., 3243 N. California Ave., Chicago 18, Ill.
Ⓥ North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
Ⓥ Potter Co., 1950 Sheridan Rd., No. Chicago, Ill. (h)
Ⓥ Sprague Electric Co., North Adams, Mass. (h)
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ Telegraph Condenser Co., Ltd., Wales Farm Rd., Acton, London, W. 3, England.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

CAPACITORS—*Precision Air*

Ⓥ Bud Radio, Inc., 2118 E. 55th St., Cleveland 3, Ohio.
Ⓥ Cardwell Mfg. Corp., Allen D., 97 Whiting St., Plainville, Conn.
Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Ⓥ Hammarlund Mfg. Co., 460 W. 34th St., New York 1, N. Y.
Ⓥ Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.
Ⓥ MUIRHEAD & CO., LTD., Beckenham, Kent, England. ADV. PG. 73.
Ⓥ NATIONAL CO., INC., 61 Sherman St., Malden 48, Mass. ADV. PG. 33 to 36.
Ⓥ North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
Ⓥ Televadio Engineering Co., 99 Wall St., New York, N. Y.

CAPACITORS—*Silvered Mica*

Ⓥ Aerovox Corp., 740 Belleville Ave., New Bedford, Mass. (h)
Ⓥ CORNELL DUBILIER ELECTRIC CORP., South Plainfield, N. J. ADV. PG. 70.
Ⓥ Electro Motive Mfg. Co., South Park & John St., Willimantic, Conn.
Ⓥ ERIE RESISTOR CORP., 644 W. 12th St., Erie, Pa. ADV. PG. 47.
Ⓥ Jeffers Electronics Inc., DuBois, Pa.
Ⓥ Maxwell Radio Corp., 1087 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Plastics & Electronics Co., 272 Northfield Ave., Rutherford, N. J.
Ⓥ Sangamo Electric Co., Springfield, Ill. (h)
Ⓥ Sprague Electric Co., North Adams, Mass. (h)
Ⓥ STANDARD COIL PRODUCTS CO., 2329 N. Pulaski Rd., Chicago 39, Ill. ADV. PG. 233.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ Telegraph Condenser Co., Ltd., Wales Farm Rd., Acton, London, W. 3, England.

CAPACITORS—*Small High Voltage*

Ⓥ Aerovox Corp., 740 Belleville Ave., New Bedford, Mass. (h)
American Condenser Co., 4410 Ravenswood Ave., Chicago 40, Ill. (h)
Ⓥ CENTRALAB DIV. of Globe Union Inc., 900 E. Keefe Ave., Milwaukee 1, Wis. ADV. PG. 64, 65. (h)
Ⓥ CONDENSER PRODUCTS CO., 1375 N. Branch St., Chicago 22, Ill. ADV. PG. 213.
Ⓥ CORNELL-DUBILIER ELECTRIC CORP., South Plainfield, N. J. ADV. PG. 70.
Ⓥ Dearborn Electronics Corp., Mineola, N. Y.
Ⓥ Deutschmann Corp., Tobe, 921 Providence Highway, Norwood, Mass. (h)
Ⓥ ERIE RESISTOR CORP., 644 W. 12th St., Erie, Pa. ADV. PG. 47.
Ⓥ Fast & Co., John E., 3101 N. Pulaski Rd., Chicago 41, Ill. (h)
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Industrial Condenser Corp., 3243 N. California Ave., Chicago 18, Ill.
Ⓥ Jeffers Electronics Inc., DuBois, Pa.
Ⓥ JENNINGS RADIO MFG. CO., 1099 E. William St., San Jose 12, Calif. ADV. PG. 114, 115.
Ⓥ Mallory & Co., Inc., P. R., 3029 E. Washington St., Indianapolis 6, Ind. (h)
Ⓥ Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.
Ⓥ Potter Co., 1950 Sheridan Rd., No. Chicago, Ill. (h)
Ⓥ Pyramid Electric Co., 155 Oxford St., Paterson, N. J.
Ⓥ Sangamo Electric Co., Springfield, Ill. (h)
Ⓥ Sprague Electric Co., North Adams, Mass. (h)
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ Telegraph Condenser Co., Ltd., Wales Farm Rd., Acton, London, W. 3, England.
Ⓥ Televadio Engineering Corp., 99 Wall St., New York, N. Y.

CAPACITORS—*Trimmer*

Ⓥ Automatic Mfg. Corp., 65 Gouverneur St., Newark 4, N. J.
Ⓥ Bud Radio, Inc., 2118 E. 55th St., Cleveland 3, Ohio.
Ⓥ CENTRALAB DIV. of Globe Union Inc., 900 E. Keefe Ave., Milwaukee 1, Wis. ADV. PG. 64, 65. (h)
Ⓥ CORNING GLASS WORKS, Corning, N. Y. ADV. PG. 134.
Ⓥ ELECTRICAL REACTANCE CORP., Elm St., Franklinville, N. Y. ADV. PG. 28, 29.
Ⓥ Electro Motive Mfg. Co., South Park & John St., Willimantic, Conn.
Ⓥ ERIE RESISTOR CORP., 644 W. 12th St., Erie, Pa. ADV. PG. 47.
Gothman Inc., Edwin L., 16 S. Throop St., Chicago, Ill.
Ⓥ Hammarlund Mfg. Co., 460 W. 34th St., New York 1, N. Y.
Ⓥ Jeffers Electronics Inc., DuBois, Pa.
Ⓥ JENNINGS RADIO MFG. CO., 1099 E. William St., San Jose 12, Calif. ADV. PG. 114, 115.
Ⓥ Johnson Co., E. F., Waseca, Minn.
Meissner Mfg. Div., Maguire Industries, Inc., Mt. Carmel, Ill.
Ⓥ Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.
Ⓥ NATIONAL CO., INC., 61 Sherman St., Malden 48, Mass. ADV. PG. 33 to 36.
Ⓥ North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Lucas Co., F. W., P. O. Box 330, Chicopee, Mass.
Ⓥ STACKPOLE CARBON CO., St. Marys, Pa. ADV. PG. 166, 167.
Ⓥ Telegraph Condenser Co., Ltd., Wales Farm Rd., Acton, London, W. 3, England.
Ⓥ Televadio Engineering Corp., 99 Wall St., New York, N. Y.
Ⓥ Wilcox Electronic Components, Inc., 234 E. 46th St., New York 17, N. Y.

CAPACITORS—*Trimmer Receiving*

Ⓥ Automatic Mfg. Corp., 65 Gouverneur St., Newark 4, N. J.
Ⓥ CENTRALAB DIV. of Globe Union Inc., 900 E. Keefe Ave., Milwaukee 1, Wis. ADV. PG. 64, 65. (h)
Ⓥ CORNING GLASS WORKS, Corning, N. Y. ADV. PG. 134.
Ⓥ Electro Motive Mfg. Co., South Park & John St., Willimantic, Conn.
Ⓥ ERIE RESISTOR CORP., 644 W. 12th St., Erie, Pa. ADV. PG. 47.
Ⓥ Hammarlund Mfg. Co., 460 W. 34th St., New York 1, N. Y.
Ⓥ MEASUREMENTS CORP., Boonton, N. J. ADV. PG. 145.
Meissner Mfg. Div., Maguire Industries, Inc., Mt. Carmel, Ill.
Ⓥ Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.
Ⓥ NATIONAL CO., INC., 61 Sherman St., Malden, Mass. ADV. PG. 33 to 36.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Sprague, Percival Inc., 311 N. College Ave., Bloomington, Ind.
Ⓥ Telegraph Condenser Co., Ltd., Wales Farm Rd., Acton, London, W. 3, England.
Ⓥ Televadio Engineering Corp., 99 Wall St., New York, N. Y.

CAPACITORS—*Variable Receiver Tuning*

Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ Cardwell Mfg. Corp., Allen D., 97 Whiting St., Plainville, Conn.
Ⓥ CENTRALAB DIV. of Globe Union Inc., 900 E. Keefe Ave., Milwaukee, Wis. ADV. PG. 64, 65. (h)
Ⓥ ERIE RESISTOR CORP., 644 W. 12th St., Erie, Pa. ADV. PG. 47.
Ⓥ Fast & Co., John E., 3101 N. Pulaski Rd., Chicago 41, Ill. (h)
Ⓥ General Instrument Corp., 829 Newark Ave., Elizabeth 3, N. J.
Ⓥ Hammarlund Mfg. Co., 460 W. 34th St., New York 1, N. Y.
Ⓥ Kings Electronics Co., Inc., 811 Lexington Ave., Brooklyn 21, N. Y.
Ⓥ MEASUREMENTS CORP., Boonton, N. J. ADV. PG. 145.
Ⓥ Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.
Ⓥ Miller Co., J. W., 5917 S. Main St., Los Angeles, Calif.
Ⓥ Mulsed Insulation Co., Aircraft Control Div., 335 E. Price St., Philadelphia, Pa.
Ⓥ NATIONAL CO., INC., 61 Sherman St., Malden 48, Mass. ADV. PG. 33 to 36.
Ⓥ North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
Oak Mfg. Co., 1260 N. Clybourn Ave., Chicago 10, Ill.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Radio Condenser Co., Camden, N. J.
Variable Condenser Corp., 85 Hope St., Brooklyn, N. Y.

CAPACITORS—*Variable Transmitter Tuning*

Ⓥ Bud Radio, Inc., 2118 E. 55th St., Cleveland 3, Ohio.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ Cardwell Mfg. Corp., Allen D., 97 Whiting St., Plainville, Conn.
Ⓥ CENTRALAB DIV. of Globe Union Inc., 900 E. Keefe Ave., Milwaukee, Wis. ADV. PG. 64, 65. (h)
Ⓥ ERIE RESISTOR CORP., 644 W. 12th St., Erie, Pa. ADV. PG. 47.
Ⓥ General Instrument Corp., 829 Newark Ave., Elizabeth 3, N. J.
Ⓥ Hammarlund Mfg. Co., 460 W. 34th St., New York 1, N. Y.
Ⓥ JENNINGS RADIO MFG. CO., 1099 E. William St., San Jose 12, Calif. ADV. PG. 114, 115. (v)
Ⓥ Johnson Co., E. F., Waseca, Minn. (p)
Ⓥ Lapp Insulator Co., Inc., Radio Specialties Div., 31 Gilbert St., Le Roy, N. Y. (p) (v)
Ⓥ Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.
Ⓥ NATIONAL CO., INC., 61 Sherman St., Malden 48, Mass. ADV. PG. 33 to 36.
Ⓥ Press Wireless Mfg. Co., Inc., Cantiague Rd., Hicksville, L. I., N. Y.

CAPACITORS—*Wax Impregnated*

Ⓥ Aerovox Corp., 740 Belleville Ave., New Bedford, Mass. (h)
American Condenser Co., 4410 Ravenswood Ave., Chicago 40, Ill. (h)
American Radionics Co., 33 Flatbush Ave., Brooklyn, N. Y.
Ⓥ Atlas Corp., 995 Grant Ave., East Newark, N. J. (h)
Ⓥ CENTRALAB DIV. of Globe Union Inc., 900 E. Keefe Ave., Milwaukee 1, Wis. ADV. PG. 64, 65. (h)
Ⓥ Chicago Condenser Corp., 3255 W. Armitage Ave., Chicago 47, Ill. (h) (p) (v)
Ⓥ CONDENSER PRODUCTS CO., 1375 N. Branch St., Chicago 22, Ill. ADV. PG. 213.
Ⓥ CORNELL-DUBILIER ELECTRIC CORP., South Plainfield, N. J. ADV. PG. 70.
Cosmic Radio Corp., 853 Whittier St., New York 59, N. Y.
Ⓥ Crown Capacitor Corp., Minot & Depot Sts., Worcester, Mass. (h)
Deutschmann Corp., Tobe, 921 Providence Highway, Norwood, Mass. (h)
Ⓥ DUMONT ELECTRIC CO., 308 Dyckman St., New York, N. Y. ADV. PG. 224. (h) (p) (v)
Ⓥ Fast & Co., John E., 3101 N. Pulaski Rd., Chicago 41, Ill. (h)
Ⓥ Hilfinger Co., Inc., The, 38-25 Bell Blvd., Bayside, N. Y. (h)
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Girard-Higgins, 1000 40th Ave., Oakland 1, Calif.
Ⓥ ILLINOIS CONDENSER CO., 1616 N. Throop St., Chicago 22, Ill. ADV. PG. 128.
Ⓥ Industrial Condenser Corp., 3243 No. California Ave., Chicago 18, Ill. (h)
Ⓥ Mallory & Co., Inc., P. R., 3029 E. Washington St., Indianapolis 6, Ind. (h)
Ⓥ Maxwell Radio Corp., 1087 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Potter Co., 1950 Sheridan Rd., No. Chicago, Ill. (h)
Ⓥ Pyramid Electric Co., 155 Oxford St., Paterson, N. J.
Ⓥ Sangamo Electric Co., Springfield, Ill. (h)
Ⓥ Sprague Electric Co., North Adams, Mass. (h)
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ Telegraph Condenser Co., Ltd., Wales Farm Rd., Acton, London, W. 3, England.
Ⓥ UNITED CONDENSER CORP., 337 E. 139th St., New York 54, N. Y. ADV. PG. 236. (h)
Ⓥ CENTRALAB DIV. of Globe Union Inc., 900 E. Keefe Ave., Milwaukee, Wis. ADV. PG. 64, 65. (h)
Ⓥ ERIE RESISTOR CORP., 644 W. 12th St., Erie, Pa. ADV. PG. 47.
Ⓥ General Instrument Corp., 829 Newark Ave., Elizabeth 3, N. J.
Ⓥ Hammarlund Mfg. Co., 460 W. 34th St., New York 1, N. Y.
Ⓥ Kings Electronics Co., Inc., 811 Lexington Ave., Brooklyn 21, N. Y.
Ⓥ MEASUREMENTS CORP., Boonton, N. J. ADV. PG. 145.
Ⓥ Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.
Ⓥ Miller Co., J. W., 5917 S. Main St., Los Angeles, Calif.
Ⓥ Mulsed Insulation Co., Aircraft Control Div., 335 E. Price St., Philadelphia, Pa.
Ⓥ NATIONAL CO., INC., 61 Sherman St., Malden 48, Mass. ADV. PG. 33 to 36.
Ⓥ North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
Oak Mfg. Co., 1260 N. Clybourn Ave., Chicago 10, Ill.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Radio Condenser Co., Camden, N. J.
Variable Condenser Corp., 85 Hope St., Brooklyn, N. Y.

CARDIOTACHOMETERS

Ⓥ SANBORN CO., 39 Osborne St., Cambridge 39, Mass. ADV. PG. 219.

CASES, PORTABLE

(for Radios, Phonographs, Amplifiers, etc.)

Ⓥ ALLIED RADIO CORP., 833 W. Jackson Blvd., Chicago 7, Ill. ADV. PG. 226.
Ⓥ Hogen Co., Inc., David, 663 Broadway, New York 12, N. Y.
Ⓥ Bud Radio, Inc., 2118 E. 55th St., Cleveland 3, Ohio.
Ⓥ Carron Mfg. Co., 415 S. Aberdeen St., Chicago, Ill.
Ⓥ Eastern Case Co., 55 S. 11th St., Brooklyn 11, N. Y.
Ⓥ Garrard Sales Corp., 164 Duane St., New York 13, N. Y.
Ⓥ Hawley Products Co., St. Charles, Ill.
Ⓥ INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
Ⓥ KARP METAL PRODUCTS CO., INC., 215 63rd St., Brooklyn 20, N. Y. ADV. PG. 53.
Ⓥ LOJACK PRECISION CORP., 93 Worth St., New York 13, N. Y. ADV. PG. 261.
Ⓥ MULTI METAL WIRE CLOTH CO., INC., 1150 Garrison Ave., New York 59, N. Y. ADV. PG. 66.
Ⓥ Pentron Corp., The, 611 W. Division St., Chicago 10, Ill.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ RICHARDSON CO., THE, 2767 Lake St., Melrose Park, Ill. ADV. PG. 144.
Ⓥ Triad Portable Case Corp., 2545 Boston Rd., Bronx 67, N. Y.
Ⓥ Waterbury Companies, Inc., Waterbury 90, Conn.

CELLS—*Photoelectric*

Ⓥ American Scientific Co., P. O. Box 1, Highbridge Station, New York 52, N. Y.
Ⓥ BRADLEY LABS., INC., 82 Meadows St., New Haven 10, Conn. ADV. PG. 152.
Ⓥ Continental Electric Co., Geneva, Ill.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ INSTRUMENT DEVELOPMENT LABORATORIES, INC., Needham Heights, Mass. ADV. PG. 243.
Ⓥ International Rectifier Corp., 6809 S. Victoria Ave., Los Angeles 43, Calif.
Ⓥ Mackay Laboratories, 1946 N. Kedzie, Chicago, Ill.
Ⓥ Photobell Company, 116 Nassau St., New York 7, N. Y.
Ripley Co., Inc., P. O. Box 31, Middletown, Conn.
Ⓥ Vickers Electric Div., Vickers, Inc., 1815 Locust St., St. Louis 3, Mo.
Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

CEMENTS—*Radio*

Ⓥ Armorold Co., 305 Franklin St., Boston 10, Mass.
Ⓥ Bakelite Div., Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y.
Ⓥ Borden Co., The, Chemical Div., 350 Madison Ave., New York 17, N. Y.
Ⓥ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
Ⓥ Hysiver Labs., Inc., C. W., 61 Chandler St., Springfield, Mass.
Ⓥ Minick Chemical Co., 29 E. Madison St., Chicago 2, Ill.
Ⓥ Mixen, C. P., 908 Chicago Ave., Chicago, Ill.
Ⓥ Paisley Products, Inc., 1770 Canalport Ave., Chicago 16, Ill.
Ⓥ Sauereisen Cements Co., Sauereisen Building, Pittsburgh 15, Pa.
Ⓥ Shellac Co., Walter L., 9306 Santa Monica Blvd., Beverly Hills, Calif.
Ⓥ ZOPHAR MILLS, INC., 112-130 26th St., Brooklyn 32, N. Y. ADV. PG. 192.

CERAMICS

See Insulation Materials

CHAMBERS—*Test*

American Instrument Co., 8030 Georgia Ave., Silver Spring, Md.
Ⓥ Bowser, Inc., Refrigeration Div., Terryville, Conn.
Serdex, Inc., 92 Cambridge St., Boston, Mass.
Ⓥ Statham Laboratories, Inc., 9328 Santa Monica Blvd., Beverly Hills, Calif.
Ⓥ Tenney Engineering Inc., 26 Avenue B, Newark 5, N. J.

CHANGERS—*Automatic Record*

Ⓥ Capehart-Farnsworth Corp., Fort Wayne, Indiana.
Ⓥ Garrard Sales Corp., 164 Duane St., New York 13, N. Y.
Ⓥ General Instrument Corp., 829 Newark Ave., Elizabeth 3, N. J.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ V-M Corp., Benton Harbor, Mich.
Ⓥ Webster-Chicago Corp., 5622 Bloomingdale Ave., Chicago 39, Ill.

CHARGERS—*Battery*

See Battery Chargers

CHASSIS, BREADBOARD

Ⓥ Uni-Products Inc., 1048 Potomac St., N. W., Washington 7, D. C.

CHASSIS—*Metal*

Ⓥ ABALON PRECISION MFG. CORP., 440 Casanova St., Bronx 59, N. Y. ADV. PG. 248.
Ⓥ ART-LLOYD METAL PRODUCTS CORP., 2973 Cropsey Ave., Brooklyn 14, N. Y. ADV. PG. 272.
Ⓥ Bud Radio, Inc., 2118 E. 55th St., Cleveland 3, Ohio.
Columbia Metal Box Co., 260 E. 143rd St., New York, N. Y.
Ⓥ Craft Mfg. Co., 3949 W. Schubert St., Chicago, Ill.
Ⓥ Donnelly Electric & Mfg. Co., 3050 Washington St., Boston, Mass.
Ⓥ Doolittle Radio, Inc., 7421 S. Loomis Blvd., Chicago 36, Ill.
Ⓥ FALSTROM CO., 44 Falstrom Court, Passaic, N. J. ADV. PG. 162.
Ⓥ Garrett Co., Inc., G. K., D & Tioga Sts., Philadelphia 34, Pa.
Ⓥ Greene Mfg. Corp., G. G., Warren, Pa.
Ⓥ INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
Ⓥ Interstate Corp., 2701 California Ave., Seattle 6, Calif.
Ⓥ Johnson Co., E. F., Waseca, Minn.
Ⓥ Kaar Engineering Co., 2995 Middlefield Rd., Palo Alto, Calif.
Ⓥ Kirk & Blum Mfg. Co., 2891 Spring Grove Ave., Cincinnati 25, Ohio.
La Magna Mfg. Co., Inc., East Rutherford, N. J.
Ⓥ LOJACK PRECISION CORP., 93 Worth St., New York 13, N. Y. ADV. PG. 261.
Ⓥ Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.
Ⓥ Minute Man Products, Inc., 109 E. 32nd St., New York 10, N. Y.
Ⓥ MULTI METAL WIRE CLOTH CO., INC., 1150 Garrison Ave., New York 59, N. Y. ADV. PG. 66.
Ⓥ NATIONAL CO., INC., 61 Sherman St., Malden 48, Mass. ADV. PG. 91 to 96.
National Electrical Machine Shops, Inc., 919 Jesup-Blair Dr., Silver Spring, Md.
Northeastern Engineering Inc., Manchester, N. H.
Ⓥ OLYMPIC METAL PRODUCTS CO., INC., Phillipsburg, N. J. ADV. PG. 148.
Ⓥ PAR-METAL PRODUCTS CORP., 32-62 49th St., Long Island City 3, N. Y. ADV. PG. 242.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Pierce Template Corp., 2646 N. Coral St., Philadelphia 25, Pa.
Ⓥ Press Wireless Mfg. Co., Inc., Eastlake Rd., Hicksville, L. I., N. Y.
REF Mfg. Corp., Jericho Turnpike, Mineola, N. Y.
Ⓥ Reiner Electronics Co., 162 W. 25th St., New York, N. Y.
Ⓥ Repath Co., Paul R., 641 E. 61st St., Los Angeles 1, Calif.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 16, N. Y.
Stamford Metal Specialty Co., Inc., 429 W. Broadway, New York 12, N. Y.
Ⓥ Uni-Products Inc., 1048 Potomac St., N. W., Washington 7, D. C.
Ⓥ Walter Co., Inc., S., 1400 Atlantic Ave., Brooklyn 16, N. Y.

CHASSIS—*Wood*

Elm Laboratories, 19 S. Broadway, Dobbs Ferry, N. Y.

CHECKERS

See also Analyzers

CHECKERS—*Crystal Rectifier*

Ⓥ Airborne Instruments Lab., Inc., 160 old Country Rd., Mineola, L. I., N. Y.
American Electroneering Co., 2112 S. LaBrea Ave., Los Angeles, Calif.
Ⓥ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ Globe Products Corp., P. O. Box 197, Southport, Conn.
MARION ELECTRICAL INSTRUMENT CO., Manchester, N. H. ADV. PG. 130.

CHECKER—*QX*

Ⓥ Clough Brengle Co., 6014 N. Broadway, Chicago, Ill.

CHECKERS—*vhf Circuit*

American Electroneering Co., 2112 S. LaBrea Ave., Los Angeles, Calif.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.

CHEMICALS—*Luminescent*

Ⓥ Canadian Radium & Uranium Corp., 630 Fifth Ave., New York 20, N. Y.
Ⓥ du Pont de Nemours & Co., Inc., E. I., Wilmington, Del.
Ⓥ du Pont de Nemours & Co., Inc., E. I., Patterson Screen Div., Towanda, Pa.
Ⓥ GENERAL CEMENT MFG., CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
Ⓥ Mallinckrodt Chemical Works, Second & Mallinckrodt Sts., St. Louis 7, Mo.
Ⓥ Merck & Co., Inc., Rahway, N. J.
Ⓥ Monsanto Chemical Co., Plastics Div., Springfield 2, Mass.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.

NOTE:
Throughout all choke listings:
(h) indicates hermetically sealed types

CHOKES—*Audio*

Acro Products Co., 5330 Baltimore Ave., Philadelphia, Pa. (h)
Ⓥ Acro Transformer Mfg. Corp., 21-20 33rd Ave., Long Island City, N. Y. (h)
Ⓥ AIRPAX PRODUCTS CO., 1024 Greenmount Ave., Baltimore 2, Md. ADV. PG. 275.
Ⓥ Altec Lansing Corp., 161 Avenue of the Americas, New York 13, N. Y.
Ⓥ American Transformer Co., 285 Emmett St., Newark, N. J. (h)
Ⓥ Atlas Coil Winders, Inc., Stamford, Conn.
Ⓥ Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md. (h)
Ⓥ Best Mfg. Co., Inc., 1200 Grove St., Irvington 1, N. J.
Ⓥ BURNELL & CO., 45 Warburton Ave., Yonkers 2, N. Y. ADV. PG. 59. (h)
Ⓥ CHICAGO TRANSFORMER DIV., Essex Wire Corp., 3501 W. Addison St., Chicago 18, Ill. ADV. PG. 225. (h)
Ⓥ Crest Transformer Corp., 1834-36 W. North Ave., Chicago 22, Ill. (h)
Ⓥ Dinion Coil Co., Inc., Caledonia, N. Y. (h)
Ⓥ Electran Mfg. Co., 4596 Elston Ave., Chicago, Ill (h)
Ⓥ Electrical Windings, Inc., 2015 N. Kolmar Ave., Chicago 39, Ill. (h)
Electronic Products Div., Epco Products, Inc., 2430 Atlantic Ave., Brooklyn 33, N. Y.
Ⓥ ELECTRONIC TRANSFORMER CO., 215 W. 25th St., New York, N. Y. ADV. PG. 116. (h)
Empire Coil Co., Inc., 238 Huguenot St., New Rochelle, N. Y.
Engineering Lab., Inc., 602 E. 4th St., Tulsa 3, Okla.
Ⓥ FERRANTI ELECTRIC, INC., 30 Rockefeller Plaza, New York 20, N. Y. ADV. PG. 81. (h)
Ⓥ FREED TRANSFORMER CO., INC., 1736 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 143. (h)
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
General Transformer Corp., 18240 Harwood Ave., Homewood, Ill.
Giolin Electric & Mfg. Co., 2921 W. Olive St., Burbank, Calif. (h)
Ⓥ Gramer Co., The, 2734 N. Pulaski Rd., Chicago 39, Ill.
Hartley Co., Ltd., H. A., 152 Hammersmith Rd., London W. 6, England.
Ⓥ HIGHLAND ENGINEERING CO., 92 Holman Blvd., Hicksville, N. Y. ADV., PG. 194. (h)
Ⓥ Hofmann Corp., C. L., 436 Blvd. of Allies, Pittsburgh, Pa.
Ⓥ Hycor Co., 11423 Vanowen St., North Hollywood, Calif. (h)
Industrive Equipment Co., Gettysburg, Pa.
Jefferson Electric Co., Bellwood, Ill.
Ⓥ K-V Transformer Corp., 4414 Park Ave., New York 57, N. Y.
Ⓥ KENYON TRANSFORMER CO., INC., 840 Barry St., New York 59, N. Y. ADV. PG. 135. (h)
Ⓥ Langevin Manufacturing Corp., 37 W. 65th St., New York 23, N. Y. (h)
Ⓥ Lenkurt Electric Co., Inc., San Carlos, Calif. (h)
Ⓥ Magnetic Instrument Co., 82 W. Main St., West Orange, N. J.
Meissner Mfg. Div., Maguire Industries, Inc., Mt. Carmel, Ill.
Ⓥ Merit Coil & Transformer Corp., 4427 N. Clark St., Chicago 40, Ill.
Ⓥ NEW YORK TRANSFORMER CO., INC., Third Ave., Alpha, N. J. ADV. PG. 184. (h)
Peerless Electrical Products Co., 6920 McKinley Ave., Los Angeles, Calif.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.

V indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

Radio Music Corp., Port Chester, N. Y.
Radionic Transformer Co., 411 S. Sangamon St., Chicago 7, Ill.
Red Arrow Electric Corp., 100 Colt St., Irvington 11, N. J. (h)
V ROLA CO., INC., THE, 2530 Superior Ave., Cleveland 14, Ohio. ADV. PG. 47.
Rollan Electrical Co., 8020 S. South Park, Chicago, Ill.
V S. N. C. Mfg. Co., Inc., Box 277, Oshkosh, Wis. (h)
V SHALLCROSS MFG. CO., 10 Jackson Ave., Collingdale, Pa. ADV. PG. 221. (h)
Smith Mfg. Co., Nathan R., 105 Pasadena Ave., So. Pasadena, Calif.
V Southwestern Industrial Electronic Co., 2831 Post Oak Rd., Houston 19, Texas. (h)
V Standard Electrical Products Co., 402 E. 1st St., Dayton 3, Ohio.
V STANDARD TRANSFORMER CORP., Elston, Keeler & Addison, Chicago 18, Ill. ADV. PG. 62.
V Stolle Engineering & Mfg. Co., 3970 S. Grand Ave., Los Angeles 37, Calif.
V Super Electric Products Corp., 46 Oliver St., Newark, N. J.
V Tele-Video Corp., 241 Fairfield Ave., Upper Darby, Pa. (h)
V Thermador Electric Mfg. Co., 5119 District Blvd., Los Angeles 22, Calif.
V Thordarson Electric Mfg. Div., Maguire Industries, Inc., 500 W. Huron St., Chicago 10, Ill.
V Transformer Engineers, 389 South Arroyo Parkway, Pasadena, Calif. (h)
V Triad Transformer Mfg. Co., 2254 Sepulveda Blvd., Los Angeles 64, Calif. (h)
V UNITED TRANSFORMER CO., 150 Varick St., New York 13, N. Y. ADV. PG. Inside Front Cover. (h)
Vokar Corp., 7300 Huron River Drive, Dexter, Mich.
V WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 48. (h)
V Wheeler Insulated Wire Co., Inc., 150 E. Aurora St., Waterbury 91, Conn.

CHOKES—*Filter*

V A. P. W. Co., 72 W. Main St., Rockaway, N. J.
V ACME ELECTRIC CORP., 31 Water St., Cuba, N. Y. ADV. PG. 210.
Aero Products Co., 1310 Baltimore Ave., Philadelphia, Pa. (h)
V Aero Transformer Mfg. Corp., 21-20 33rd Ave., Long Island City, N. Y. (h)
V AEROLITE ELECTRONIC HARDWARE CORP., 647 Fifth St., Union City, N. J. ADV. PG. 138.
V AIRPAX PRODUCTS CO., 1024 Greenmount Ave., Baltimore 2, Md. ADV. PG. 275.
V Atlas Lansing Corp., 161 Avenue of the Americas, New York 13, N. Y. (h)
V AMERICAN TELEVISION & RADIO CO., 300 E. 4th St., St. Paul 1, Minn. ADV. PG. 275.
V American Transformer Co., 285 Emmett St., Newark, N. J. (h)
V Atlas Coil Winders, Inc., Stamford, Conn.
V Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md. (h)
V Best Mfg. Co., Inc., 1200 Grove St., Irvington 11, N. J.
Bittermann Electric Co., Box 665, Canaan, Conn.
V BOND ELECTRONICS CORP., 68 Franklin Place, Summit, N. J. ADV. PG. 250.
V Cassell Burns Mfg. Co., 400 Broome St., New York 13, N. Y.
V CHICAGO TRANSFORMER DIV., Essex Wire Corp., 3501 W. Addison St., Chicago 18, Ill. ADV. PG. 220.
Coil Winders, Inc., 61 Bergen St., Brooklyn 7, N. Y.
V Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
V COMMUNICATION ACCESSORIES CO., Box 345, 11049 St. & Hillcrest Rd., Hickman Mills, Missouri. ADV. PG. 178.
V Continental Electric Co., Inc., 354 Ferry St., Newark 5, N. J.
V Crest Transformer Corp., 1614-26 W. North Ave., Chicago 22, Ill.
V DECOURSEY ENGINEERING LAB., P. O. Box 231, Los Angeles 25, Calif. ADV. PG. 214.
V Dressler Electric Co., 942 E. Lionel St., Detroit 7, Mich.
V Elmore Coil Co., Inc., Oklahoma, N. Y.
V Electrical Mfg. Co., 4646 Elston Ave., Chicago 30, Ill.
V Electrical Windings, Inc., 2015 N. Kolmar Ave., Chicago 39, Ill.
Electrical Transformer Co., Westerly Rd., Deshing, N. Y.
Electro Engineering Works, 6021 College Ave., Oakland 18, Calif.
V ELECTRONIC TRANSFORMER CO., 215 W. 25th St., New York, N. Y. ADV. PG. 116.
V Essex Electronics, Berkeley Heights, N. J.
V FERRANTI ELECTRIC, INC., 30 Rockefeller Plaza, New York 20, N. Y. ADV. PG. 81.
V FREED TRANSFORMER CO., INC., 1716 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 141.
V GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
General Transformer Co., 18240 Harwood Ave., Homewood, Ill.
Goslin Electric & Mfg. Co., 2921 W. Olive St., Burbank, Calif. (h)
V Gramer Company, The, 2734 N. Pulaski Rd., Chicago 39, Ill. (h)
Hartley Co., Ltd., H. A., 152 Hammersmith Rd., London W. 6, England.
V Hercules Electric & Mfg. Co., Inc., 2500 Atlantic Ave., Brooklyn 7, N. Y.
V HIGHLAND ENGINEERING CO., 32 Holman Blvd., Hicksville, N. Y. ADV. PG. 194.
Inductive Equipment Co., Gettysburg, Pa.
V K-V Transformer Co., 4414 Park Ave., New York 57, N. Y.
V KENYON TRANSFORMER CO., INC., 840 Barry St., New York 59, N. Y. ADV. PG. 135. (h)
V Langevin Manufacturing Corp., 37 W. 65th St., New York, N. Y. (h)
V Lenkurt Electric Co., Inc., San Carlos, Calif. (h)
V Magnetic Instrument Co., 82 W. Main St., West Orange, N. J.
V Merit Coil & Transformer Corp., 4427 N. Clark St., Chicago 40, Ill.
V Miller Co., J. W., 5917 S. Main St., Los Angeles, Calif.
V NEW YORK TRANSFORMER CO., INC., Third Ave., Alpha, N. J. ADV. PG. 184. (h)
V OPAD-GREEN CO., 71 Warren St., New York 7, N. Y. ADV. PG. 274.
Peerless Electrical Products Co., 6920 McKinley Ave., Los Angeles 1, Calif.
V Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Radionic Transformer Co., 411 S. Sangamon St., Chicago 7, Ill.
V RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 267.
Red Arrow Electric Corp., 100 Colt St., Irvington 11, N. J. (h)
V ROLA CO., INC., The, 2530 Superior Ave., Cleveland 14, Ohio. ADV. PG. 47.
Rollan Electrical Co., 8020 S. South Park, Chicago, Ill.
V S. N. C. Mfg. Co., Inc., Box 277, Oshkosh, Wis. (h)
V SORENSON & CO., INC., 375 Fairfield Ave., Stamford, Conn. ADV. PG. 141.
V Southwestern Industrial Electronic Co., 2831 Post Oak Rd., Houston 19, Texas. (h)
V Standard Electrical Products Co., 402 E. 1st St., Dayton 3, Ohio.
V Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
V STANDARD TRANSFORMER CORP., Elston, Keeler & Addison, Chicago 18, Ill. ADV. PG. 62.
V Stolle Engineering & Mfg. Co., 3970 S. Grand Ave., Los Angeles 37, Calif.
V Super Electric Products Corp., 46 Oliver St., Newark, N. J.
V Tele-Video Corp., 241 Fairfield Ave., Upper Darby, Pa. (h)
V Thermador Electric Mfg. Co., 5119 District Blvd., Los Angeles 22, Calif.
V Thordarson Electric Mfg. Div., Maguire Industries, Inc., 500 W. Huron St., Chicago 10, Ill.
V Transformer Engineers, 389 South Arroyo Parkway, Pasadena, Calif. (h)
V Triad Transformer Mfg. Co., 2254 Sepulveda Blvd., Los Angeles 64, Calif. (h)
V UNITED TRANSFORMER CO., 150 Varick St., New York 13, N. Y. Inside Front Cover. (h)
Vokar Corp., 7300 Huron River Drive, Dexter, Mich.
V WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 48.
V Wheeler Insulated Wire Co., Inc., 150 E. Aurora St., Waterbury 91, Conn.

CHOKES—*Power*

V ACME ELECTRIC CORP., 31 Water St., Cuba, N. Y. ADV. PG. 210.
Aero Products Co., 1310 Baltimore Ave., Philadelphia, Pa. (h)
V Aero Transformer Mfg. Corp., 21-20 33rd Ave., Long Island City, N. Y. (h)
V AIRPAX PRODUCTS CO., 1024 Greenmount Ave., Baltimore 2, Md. ADV. PG. 275.
V Atlas Lansing Corp., 161 Avenue of the Americas, New York 13, N. Y. (h)
V AMERICAN TELEVISION & RADIO CO., 300 E. 4th St., St. Paul 1, Minn. ADV. PG. 275.
V American Transformer Co., 285 Emmett St., Newark, N. J. (h)
V Atlas Coil Winders, Inc., Stamford, Conn.
V Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md. (h)
Bittermann Electric Co., Box 665, Canaan, Conn.
V BOND ELECTRONICS CORP., 68 Franklin Pl., Summit, N. J. ADV. PG. 250.
V CHICAGO TRANSFORMER DIV., Essex Wire Corp., 3501 W. Addison St., Chicago 18, Ill. ADV. PG. 220.
V CIMA CORP., 91 Boylston St., Jamaica Plain 30, Mass. ADV. PG. 264.
V Crest Transformer Corp., 1614-26 W. North Ave., Chicago 22, Ill.
V Elmore Coil Co., Inc., Oklahoma, N. Y.
V Dressler Electric Co., 942 E. Lionel St., Detroit 7, Mich.
V Electrical Mfg. Co., 4646 Elston Ave., Chicago 30, Ill.
V Electrical Windings, Inc., 2015 N. Kolmar Ave., Chicago 39, Ill. (h)
Electrical Transformer Co., Westerly Rd., Deshing, N. Y.
Electro Engineering Works, 6021 College Ave., Oakland 18, Calif.
V ELECTRONIC TRANSFORMER CO., 215 W. 25th St., New York, N. Y. ADV. PG. 116. (h)
V Essex Electronics, Berkeley Heights, N. J. (h)
V FERRANTI ELECTRIC, INC., 30 Rockefeller Plaza, New York 20, N. Y. ADV. PG. 81. (h)
V FREED TRANSFORMER CO., INC., 1716 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 141. (h)
V GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
General Transformer Co., 18240 Harwood Ave., Homewood, Ill.
Goslin Electric & Mfg. Co., 2921 W. Olive St., Burbank, Calif. (h)
V Gramer Company, The, 2734 N. Pulaski Rd., Chicago 39, Ill. (h)
Hartley Co., Ltd., H. A., 152 Hammersmith Rd., London W. 6, England.
V Hercules Electric & Mfg. Co., Inc., 2500 Atlantic Ave., Brooklyn 7, N. Y.
V HIGHLAND ENGINEERING CO., 32 Holman Blvd., Hicksville, N. Y. ADV. PG. 194.
Inductive Equipment Co., Gettysburg, Pa.
V K-V Transformer Co., 4414 Park Ave., New York 57, N. Y.
V KENYON TRANSFORMER CO., INC., 840 Barry St., New York 59, N. Y. ADV. PG. 135. (h)
V Langevin Manufacturing Corp., 37 W. 65th St., New York, N. Y. (h)
V Lenkurt Electric Co., Inc., San Carlos, Calif. (h)
V Magnetic Instrument Co., 82 W. Main St., West Orange, N. J.
V Merit Coil & Transformer Corp., 4427 N. Clark St., Chicago 40, Ill.
V OHMITE MFG. CO., 4835 W. Flournoy St., Chicago 44, Ill. ADV. PG. 93.
V OPAD-GREEN CO., 71 Warren St., New York 7, N. Y. ADV. PG. 274.
Peerless Electrical Products Co., 6920 McKinley Ave., Los Angeles 1, Calif.
V Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
V RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 267.
Red Arrow Electric Corp., 100 Colt St., Irvington 11, N. J. (h)
V S. N. C. Mfg. Co., Inc., Box 277, Oshkosh, Wis. (h)
V Standard Electrical Products Co., 402 E. 1st St., Dayton 3, Ohio.
V STANDARD TRANSFORMER CORP., Elston, Keeler & Addison, Chicago 18, Ill. ADV. PG. 62.
V Stolle Engineering & Mfg. Co., 3970 S. Grand Ave., Los Angeles 37, Calif.
V Super Electric Products Corp., 46 Oliver St., Newark, N. J.
V Thermador Electric Mfg. Co., 5119 District Blvd., Los Angeles 22, Calif.
V Thordarson Electric Mfg. Div., Maguire Industries, Inc., 500 W. Huron St., Chicago 10, Ill.
V Triad Transformer Mfg. Co., 2254 Sepulveda Blvd., Los Angeles 64, Calif. (h)
V UNITED TRANSFORMER CO., 150 Varick St., New York 13, N. Y. ADV. PG. Inside Front Cover. (h)
V WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 48. (h)
V Wheeler Insulated Wire Co., Inc., 150 E. Aurora St., Waterbury 91, Conn.

CHOKES—*r-f (Heavywire Low Voltage)*

V A. P. W. Co., 72 W. Main St., Rockaway, N. J.
V ACME ELECTRIC CORP., 31 Water St., Cuba, N. Y. ADV. PG. 210.
V Atlas Lansing Corp., 161 Avenue of the Americas, New York 13, N. Y.
V Atlas Coil Winders, Inc., Stamford, Conn.
Bittermann Electric Co., Box 665, Canaan, Conn.
V BOND ELECTRONICS CORP., 68 Franklin Place, Summit, N. J. ADV. PG. 250.
V Cassell Burns Mfg. Co., 400 Broome St., New York 13, N. Y.
V CIMA CORP., 91 Boylston St., Jamaica Plains 30, Mass. ADV. PG. 264.
Coil Winders, Inc., 61 Bergen St., Brooklyn 7, N. Y.
V COMMUNICATION ACCESSORIES CO., Box 345, 11049 St. & Hillcrest Rd., Hickman Mills, Mo. ADV. PG. 178.
Continental Electronics Mfg. Co., 1724 Wood St., Dallas 1, Texas.
V ELECTRONIC TRANSFORMER CO., INC., 215 W. 25th St., New York, N. Y. ADV. PG. 116. (h)
V Fast & Co., John E., 3131 N. Pulaski Rd., Chicago 41, Ill.
V Gramer Co., Inc., The, 3826 Bell Blvd., Bayside, L. I., N. Y.
V Hercules Electric & Mfg. Co., Inc., 2500 Atlantic Ave., Brooklyn 7, N. Y.
Inductive Equipment Co., Gettysburg, Pa.
V INSTRUMENT RESISTORS CO., 1036 Commerce Ave., Union, N. J. ADV. PG. 174, 175.
V INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
V INTERNATIONAL RESISTANCE CO., 401 N. Broad St., Philadelphia 8, Pa. ADV. PG. 88, 89.

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

Ⓥ Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.
Ⓥ Miller Co., J. W., 5917 S. Main St., Los Angeles, Calif.
Ⓥ NATIONAL CO., INC., 61 Sherman St., Malden 48, Mass. ADV. PG. 33 to 36.
Ⓥ OHMITE MFG. CO., 4835 W. Flournoy St., Chicago 44, Ill. ADV. PG. 83.
Ⓥ RAYTHEON MFG. CO., Power Tube Div., Waltham 4, Mass. ADV. PG. 257.
Rotlan Electrical Co., 8020 S. South Park, Chicago, Ill.
Ⓥ S. N. C. Mfg. Co., Inc., Box 277, Oshkosh, Wis. (h)
Ⓥ Standard Electrical Products Co., 402 E. 1st St., Dayton 2, Ohio.
Ⓥ Stolle Engineering & Mfg. Co., 3970 S. Grand Ave., Los Angeles 37, Calif.
Ⓥ U. S. ELECTRONICS CORP., 276 Warren St., Lyndhurst, N. J. ADV. PG. 266.
Vokar Corp., 7300 Huron River Drive, Dexter, Mich.

CHOKES—*r-f & i-f*

Ⓥ ACME ELECTRIC CORP., 31 Water St., Cuba, N. Y. ADV. PG. 210.
Ⓥ AEROLITE ELECTRONIC HARDWARE CORP., 507 26th St., Union City, N. J. ADV. PG. 138.
Ⓥ Atlas Coil Winders, Inc., Stamford, Conn.
Ⓥ Automatic Mfg. Corp., 65 Gouverneur St., Newark 4, N. J.
Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ BOND ELECTRONICS CORP., 88 Franklin Pl., Summit, N. J. ADV. PG. 250.
Ⓥ Bud Radio, Inc., 2118 E. 55th St., Cleveland 3, Ohio.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Burnett Radio Lab., Wm. W. L., 4814 Idaho St., San Diego, Calif.
Ⓥ Caddell-Burns Mfg. Co., 480 Broome St., New York 13, N. Y.
Ⓥ CAMBRIDGE THERMONIC CORP., 445 Concord Ave., Cambridge, Mass. ADV. PG. 72.
Ⓥ Carron Mfg. Co., 415 S. Aberdeen St., Chicago, Ill.
Ⓥ CLAROSTAT MFG. CO., INC., Dover, N. H. ADV. PG. 227.
Ⓥ Clippard Instrument Laboratory, Inc., 1125 Bank St., Cincinnati 14, Ohio.
Coil Winders Inc., 61 Bergen St., Brooklyn 2, N. Y. (h)
Continental Electronics Mfg. Co., 1728 Wood St., Dallas 1, Texas.
Ⓥ Doolittle Radio, Inc., 7421 S. Loomis Blvd., Chicago 36, Ill.
Ⓥ Electronic Coils, Inc., P. O. Box 1641, 44 Taylor St., Springfield, Mass.
Ⓥ ELECTRONIC TRANSFORMER CO., INC., 215 W. 25th St., New York, N. Y. ADV. PG. 116. (h)
Essex Electronics, Berkeley Heights, N. J. (h)
Ⓥ FUGLE-MILLER LABORATORIES, 398 Main St., Metuchen, N. J. ADV. PG. 164.
Ⓥ Gice Products Corp., P. O. Box 197, Southport, Conn.
Ⓥ HARNETT ELECTRIC CORP., 138 Haven Ave., Port Washington, L. I., N. Y. ADV. PG. 182.
Ⓥ HILLBURN ELECTRONIC PRODUCTS CO., 55 Nassau Ave., Brooklyn 22, N. Y. ADV. PG. 46.
Ⓥ HOULIHAN CO., T. J., 2508-14 W. Lawrence Ave., Chicago, Ill. ADV. PG. 276.
Inductive Equipment Co., Gettysburg, Pa.
Ⓥ INSTRUMENT RESISTORS INC., 1036 Commerce Ave., Union, N. J. ADV. PG. 174, 175.
Ⓥ INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
Ⓥ INTERNATIONAL RESISTANCE CO., 401 N. Broad St., Philadelphia 8, Pa. ADV. PG. 88, 89.
Ⓥ Jeffers Electronics Inc., DuBois, Pa.
Ⓥ Johnson Co., E. F., Waseca, Minn.
Leonard Electric Products Co., 1562 61st St., Brooklyn, N. Y.
Ⓥ Lewis Spring & Mfg. Corp., 2656 W. North Ave., Chicago 47, Ill.
Lorel Electronics Corp., 794 E. 140th St., New York 54, N. Y.
Ⓥ MEASUREMENTS CORP., Boonton, N. J. ADV. PG. 145.
Meissner Mfg. Div., Maguire Industries Inc., Mt. Carmel, Ill.
Ⓥ Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.
Ⓥ Miller Co., J. W., 5917 S. Main St., Los Angeles, Calif.
Muter Co., 1255 S. Michigan Ave., Chicago, Ill.
Ⓥ NATIONAL CO., INC., 61 Sherman St., Malden 48, Mass. ADV. PG. 33 to 36.
Ⓥ OHMITE MFG. CO., 4835 W. Flournoy St., Chicago 44, Ill. ADV. PG. 83.
Ⓥ Pulse Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ RAYTHEON MFG. CO., Power Tube Div., Waltham 54, Mass. ADV. PG. 257.
Rotlan Electrical Co., 8020 S. South Park, Chicago, Ill.
Ⓥ SHALLCROSS MFG. CO., 10 Jackson Ave., Collingdale, Pa. ADV. PG. 221. (h)
Stokes Co., F. W., P. O. Box 330, Chicopee, Mass.
Ⓥ STANDARD COIL PRODUCTS CO., 2329 N. Pulaski Rd., Chicago 39, Ill. ADV. PG. 233.
Ⓥ Standard Electrical Products Co., 402 E. 1st St., Dayton 2, Ohio.
Ⓥ Stanwyck Winding Co., 137 Walsh Ave., Newburgh, N. Y.
Ⓥ Stolle Engineering & Mfg. Co., 3970 S. Grand Ave., Los Angeles 37, Calif.
Ⓥ Super Electric Products Corp., 46 Oliver St., Newark, N. J.
Ⓥ Teleradio Engineering Corp., 99 Wall St., New York, N. Y.
Ⓥ U. S. ELECTRONICS CORP., 276 Warren St., Lyndhurst, N. J. ADV. PG. 266.
Vokar Corp., 7300 Huron River Drive, Dexter, Mich.
Wilkor Products, Inc., 3835 W. 150th St., Cleveland 11, Ohio.

CHRONAXIMETERS

Ⓥ Electro Medical Lab., Holliston, Mass.
Ⓥ Manufacturers Engr. & Equip. Corp., Willow Grove, Pa.

CHRONOGRAPHS—*Inertialess*

Ⓥ Airlectron, P. O. Box 151, Caldwell, N. J.
Ⓥ Electro-Medical Lab. Inc., Holliston, Mass.
Ⓥ Gorrell & Gorrell, Haworth, N. J.
Ⓥ POTTER INSTRUMENT CO., INC., 115 Cutter Mill Rd., Great Neck, N. Y. ADV. PG. 204.

CHRONOSCOPES

Ⓥ AMERICAN CHRONOSCOPE CORP., 316 W. First St., Mt. Vernon, N. Y. ADV. PG. 84.
Ⓥ Berkeley Scientific Co., Richmond, Calif.
Ⓥ POTTER INSTRUMENT CO., INC., 115 Cutter Mill Rd., Great Neck, N. Y. ADV. PG. 204.
Ⓥ RAWSON ELECTRICAL CO., 111 Potter St., Cambridge 42, Mass. ADV. PG. 156.
Ⓥ Standard Electric Time Co., 89 Logan St., Springfield, Mass.
Stecht Co., Inc., Herman, 27 Park Place, New York 7, N. Y.

CIRCUITS—*Printed or Stamped*

Austin Co., Inc., O., 335 Throop Ave., Brooklyn 21, N. Y.
Ⓥ CENTRALAB, DIV. of Globe Union Inc., 900 E. Keefe Ave., Milwaukee 1, Wis. ADV. PG. 64, 65.
Ⓥ CORNING GLASS WORKS, Corning, N. Y. ADV. PG. 134.
Ⓥ Cossor (Canada) Ltd., 301-303 Windsor St., Halifax, N. S., Canada.
Electronic Mechanics Inc., 70 Clifton Blvd., Clifton, N. J.
Ⓥ Etched Products Corp., 39-01 Queens Blvd., Long Island City, N. Y.
Ⓥ Herlec Corp., The, 422 Fifth St., Milwaukee 3, Wis.
Ⓥ Molded Insulation Co., Aircraft Control Div., 335 E. Price St., Philadelphia, Pa.
Ⓥ Plastics & Electronics Co., 272 Northland Ave., Buffalo 8, N. Y.

CITIZENS RADIO

Ⓥ Cervone & Bitter, 2332 Ontario Rd., NW, Washington 9, D. C.
Jamaica Television Mfg. Co., 95-26 Sutphin Blvd., Jamaica 4, N. Y.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Plastics & Electronics Co., 272 Northland Ave., Buffalo 8, N. Y.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.

CLIPS—*Grid*

Ⓥ AEROLITE ELECTRONIC HARDWARE CORP., 506 26th St., Union City, N. J. ADV. PG. 138.
Ⓥ Aircraft-Marine Products, Inc., 1523 N. Fourth St., Harrisburg, Pa.
Ⓥ CINCH MFG. CORP., 1026 S. Homan Ave., Chicago 24, Ill. ADV. PG. 154.
Ⓥ FEDERAL SCREW PRODUCTS INC., 224 W. Huron St., Chicago 10, Ill. ADV. PG. 271.
Ⓥ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
Ⓥ INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
Ⓥ Johnson Co., E. F., Waseca, Minn.
Ⓥ Kulka Electric Mfg. Co., Inc., 30 South St., Mt. Vernon, N. Y.
Ⓥ Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.
Ⓥ NATIONAL CO., INC., 61 Sherman St., Malden 48, Mass. ADV. PG. 33 to 36.
Ⓥ Schott Co., Walter L., 9306 Santa Monica Blvd., Beverly Hills, Calif.
Ⓥ Smith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.

CLIPS & CLAMPS—*Test & Tube*

Ⓥ AEROLITE ELECTRONIC HARDWARE CORP., 507 26th St., Union City, N. J. ADV. PG. 138.
Ⓥ ALDEN PRODUCTS CO., 117 N. Main St., Brockton 64, Mass. ADV. PG. 235.
Birtcher Corp., 5087 Huntington Dr., Los Angeles 32, Calif.
Ⓥ BREEZE CORPS., INC., 41 S. Sixth St., Newark 7, N. J. ADV. PG. 93.
Ⓥ FEDERAL SCREW PRODUCTS INC., 224 W. Huron St., Chicago 10, Ill. ADV. PG. 271.
Ⓥ Franklin Mfg. Corp., A. W., 43-20 34th St., Long Island City, N. Y.
Ⓥ Grammes & Sons Inc., L. F., 389 Union St., Allentown 2, Pa.
Ⓥ GRAYHILL, 4524 W. Madison St., Chicago 24, Ill. ADV. PG. 250.
Gregory Mfg. Co., Inc., The, 67 Franklin St., New Haven 11, Conn.
Ⓥ INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
Ⓥ J F D MFG. CO., 6101-23 Sixteenth Ave., Brooklyn, N. Y. ADV. PG. 254, 264.
Ⓥ Johnson Co., E. F., Waseca, Minn.
Ⓥ Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.
Ⓥ Mierallac Electric Co., 25 N. Peoria St., Chicago, Ill.
Ⓥ Morse Co., Frank W., 1300 Soldiers Field Rd., Boston 35, Mass.
Ⓥ Mueller Electric Co., 1583 E. 31st St., Cleveland 14, Ohio.
Ⓥ Penn-Union Electric Corp., 315 State Street, Erie, Pa.
Prestole Corp., 3119 Bellevue Rd., Toledo 6, Ohio.
Ⓥ Rapid Specialties Co., 325 W. Huron St., Chicago 10, Ill.
Ⓥ Smith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.
Ⓥ TIMES FACSIMILE CORP., 229 W. 43rd St., New York 18, N. Y. ADV. PG. 50.
Ⓥ Tinnerman Products Inc., 2038 Fulton Rd., Cleveland 13, Ohio.
Ⓥ Tric Fuse Mfg. Co., 2948 N. Fifth, Milwaukee 12, Wis.
Ⓥ United Technical Labs., Box 425-W, Morristown, N. J.

CLOTHS—*Speaker Grille*

Ⓥ Bestcraft Products, 14 Delancey St., New York, N. Y.
Ⓥ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
Ⓥ J F D MFG. CO., 6101-23 Sixteenth Ave., Brooklyn, N. Y. ADV. PG. 254, 264.
Ⓥ Olek & Sons, Inc., A., 4757-59 Melrose St., Philadelphia 37, Pa.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Schott Co., Walter L., 9306 Santa Monica Blvd., Beverly Hills, Calif.

CLOTHS—*Woven Wire*

Ⓥ Bestcraft Products, 14 Delancey St., New York, N. Y.
Ⓥ Chase Brass & Copper Co., Inc., Waterbury 91, Conn.
Ⓥ J F D MFG. CO., 6101-23 Sixteenth Ave., Brooklyn, N. Y. ADV. PG. 254, 264.
Ⓥ JELLIFF MFG. CORP., C. O., 200 Pequot Ave., Southport, Conn. ADV. PG. 46.
MULTI METAL WIRE CLOTH CO., INC., 1350 Garrison Ave., New York 59, N. Y. ADV. PG. 66.
Ⓥ Schott, Walter L., 9306 Santa Monica Blvd., Beverly Hills, Calif.

COATINGS—*Conductive*

See Also, Graphite, Colloidal

Ⓥ Acheson Colloids Corp., Port Huron, Mich.
Ⓥ Austin Co., O., 335 Throop Ave., Brooklyn 21, N. Y.
Ⓥ CORNING GLASS WORKS, Corning, N. Y. ADV. PG. 134.
Ⓥ Crystal Research Labs., Inc., 29 Allyn St., Hartford, Conn.
Ⓥ du Pont de Nemours & Co., Inc., E. I., Wilmington, Del.
Ⓥ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
Ⓥ MICRO-CIRCUITS CO., New Buffalo, Mich. ADV. PG. 222.
Ⓥ Premier Crystal Labs., Inc., 79-89 Seventh Ave., New York 11, N. Y.
Process & Instruments, 60 Greenpoint Ave., Brooklyn 22, N. Y.
Ⓥ Sauereisen Cements Co., Sauereisen Bldg., Pittsburgh 15, Pa.
Superior Flake Graphite Co., 35 S. Clark St., Chicago 3, Ill.
Ⓥ ZOPHAR MILLS, INC., 112-130 26th St., Brooklyn 32, N. Y. ADV. PG. 192.

COATINGS-CONDUCTIVE—*Tube Interior*

Ⓥ Acheson Colloids Corp., Port Huron, Mich.
Ⓥ MICRO-CIRCUITS CO., New Buffalo, Mich. ADV. PG. 222.
Ⓥ Optical Film Engineering Co., 2125 Cherry St., Philadelphia 3, Pa.

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Ⓥ Premier Crystal Labs., Inc., 29-89 Seventh Ave., New York 11, N. Y.
Superior Flake Graphite Co., 33 S. Clark St., Chicago 3, Ill.

COATINGS—*Protective*

Ⓥ Acheson Colloids Corp., Port Huron, Mich.
Ⓥ American Chemical Paint Co., Ambler, Pa.
Austin Co., O., 335 Throop Ave., Brooklyn 21, N. Y.
Ⓥ BIWAX CORP., 3445 Howard St., Skokie, Ill. ADV. PG. 247.
Dow Chemical Co., Midland, Mich.
Ⓥ E. I. du Pont de Nemours & Co., Inc., E. T. Willington, Del.
Egyptian Lacquer Mfg. Co., Lafayette, Ind.
Ⓥ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 219.
George Co., P. D., 5200 N. 2nd St., St. Louis, Mo.
Ⓥ Hamilton Kent Mfg. Co., Kent, Ohio.
Ⓥ INSL-X CO., INC., Water St. & Broadway, Dunkirk, N. Y. ADV. PG. 256.
Ⓥ Jackson Steel Co. and Divisions, By-Products Steel Co. and Lukenweld, 447 Likens Building, Coatesville, Pa.
Ⓥ MICRO-CIRCUITS CO., New Buffalo, Mich. ADV. PG. 222.
Ⓥ Monsanto Chemical Co., Plastics Div., Springfield 2, Mass.
Ⓥ Nukem Products Corp., 111 Colgate Ave., Buffalo 20, N. Y.
Ⓥ Paisley Products Inc., 1770 Canalport Ave., Chicago 16, Ill.
Ⓥ Reilly Tar & Chemical Corp., 1615 Merchants Bank Bldg., 11 S. Meridian St., Indianapolis, Ind.
Ⓥ Sauereisen Cements Co., Sauereisen Bldg., Pittsburgh 15, Pa.
Ⓥ Schenectady Varnish Co., Schenectady, N. Y.
Ⓥ Sherwin-Williams Co., 101 Prospect Ave., N. W., Cleveland 1, Ohio.
Ⓥ Southwestern Industrial Electronic Co., 2351 Post Oak Rd., Houston 19, Texas.
Ⓥ Stanford Varnish Works, 2695 Richmond Terrace, Staten Island 3, N. Y.
Ⓥ Stoner-Mudge, Inc., Chemical Div., Cambridge, Mass.
Ⓥ U. S. Rubber Co., 1230 Avenue of the Americas, New York 20, N. Y.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Ⓥ ZOPHAR MILLS, INC., 112-130 26th St., Brooklyn 32, N. Y. ADV. PG. 192.

COATINGS—*Salt Spray Resistance*

Ⓥ Acheson Colloids Corp., Port Huron, Mich.
Ⓥ E. I. du Pont de Nemours & Co., Inc., E. T. Willington, Del.
Egyptian Lacquer Mfg. Co., Lafayette, Ind.
George Co., P. D., 5200 N. 2nd St., St. Louis, Mo.
Ⓥ Hamilton Kent Mfg. Co., Kent, Ohio.
Ⓥ INSL-X CO., INC., Water St. & Broadway, Dunkirk, N. Y. ADV. PG. 256.
Ⓥ Nukem Products Corp., 111 Colgate Ave., Buffalo 20, N. Y.
Ⓥ Parker Rust Proof Co., 2177 E. Milwaukee Ave., Detroit, Mich.
Ⓥ Reilly Tar & Chemical Corp., 1615 Merchants Bank Bldg., 11 S. Meridian St., Indianapolis, Ind.
Ⓥ Schenectady Varnish Co., Schenectady, N. Y.
Ⓥ Sherwin-Williams Co., 101 Prospect Ave., N. W., Cleveland 1, Ohio.
Ⓥ Southwestern Industrial Electronic Co., 2351 Post Oak Rd., Houston 19, Texas.
Special Chemicals Corp., 30 Irving Pl., New York, N. Y.
Ⓥ Stanford Varnish Works, 2695 Richmond Terrace, Staten Island 3, N. Y.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Ⓥ ZOPHAR MILLS, INC., 112-130 26th St., Brooklyn 32, N. Y. ADV. PG. 192.

CODE & TAB MARKERS

Austin Co., O., 335 Throop Ave., Brooklyn 21, N. Y.
Tagliabue Type Co., Huber Bldg., York, Pa.
Ⓥ Western Lithograph Co., E. 7 Tide Div., 1016 E. Second St., Los Angeles 54, Calif.

COIL ASSEMBLIES

Ⓥ A.P.W. Co., 72 W. Main St., Rockaway, N. J.
Acme Wire Co., New Haven 14, Conn.
Ⓥ AEROLITE ELECTRONIC HARDWARE CORP., 507 26th St., Union City, N. J. ADV. PG. 138.
Ⓥ ALLIED CONTROL CO., INC., 2 East End Ave., New York 21, N. Y. ADV. PG. 98, 99.
Ⓥ American Relay & Controls Inc., 4901 W. Flournoy St., Chicago 44, Ill.
Atlas Coil Winders Inc., Stamford, Conn.
Ⓥ Automatic Mfg. Corp., 65 Gouverneur St., Newark 4, N. J.
Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Bitterman Electric Co., Box 665, Canaan, Conn.
Ⓥ BOND ELECTRONICS CORP., 88 Franklin Place, Summit, N. J. ADV. PG. 250.
Ⓥ Bud Radio, Inc., 2118 E. 55th St., Cleveland 3, Ohio.
Ⓥ Cassell Burns Mfg. Co., 480 Broome St., New York 13, N. Y.
Ⓥ CAMBRIDGE THERMIONIC CORP., 445 Concord Ave., Cambridge, Mass. ADV. PG. 72.
Ⓥ Clippard Instrument Laboratory, Inc., 1125 Bank St., Cincinnati 14, Ohio.
Coil Winders Inc., 61 Bergen St., Brooklyn 2, N. Y.
Ⓥ Collins Radio Co., Cedar Rapids, Iowa.
Ⓥ Connecticut Telephone & Electric Div. of Great American Industries Inc., 70 Britannia St., Meriden, Conn.
Ⓥ DANO ELECTRIC CO., Main St., Winsted, Conn. ADV. PG. 273.
Ⓥ Davis & Co., Dean W., Kentland, Ind.
Ⓥ Eastern Specialty Co., Philadelphia 40, Pa.
Ⓥ Electron Mfg. Co., 4596 Elston Ave., Chicago, Ill.
Ⓥ Electronic Coils, Inc., P. O. Box 1641, 44 Taylor St., Springfield, Mass.
Ⓥ ELECTRONIC DESIGNS, INC., Irvington, N. J. ADV. PG. 299.
Ⓥ Electronic Engineering Corp., 624 Ridge Rd., Lyndhurst, N. J.
Electronic Indicator Corp., 53 Wyckoff St., Brooklyn, N. Y.
Ⓥ ELECTRONIC TRANSFORMER CO., INC., 215 W. 25th St., New York N. Y. ADV. PG. 316.
Ⓥ Fisher Electronics, Berkeley Heights, N. J.
Ⓥ Fitzsimons Mfg. Co., Inc., Woods Church Rd., Flemington, N. J.
Ⓥ FREED TRANSFORMER CO., INC., 1716 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 143.
Ⓥ FUGLE-MILLER LABORATORIES, 398 Main St., Metuchen, N. J. ADV. PG. 264.
Gavin Labs., Inc., 2 East End Ave., New York 21, N. Y.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 16.
Ⓥ Gramer Co., Edwin L., 14 S. Throop St., Chicago, Ill.
Ⓥ HARNETT ELECTRIC CORP., 138 Haven Ave., Port Washington, N. Y. ADV. PG. 282.
Ⓥ HIGHLAND ENGINEERING CO., 32 Holman Blvd., Hicksville, N. Y. ADV. PG. 194.
Ⓥ HILLBURN ELECTRONIC PRODUCTS CO., 55 Nassau St., Brooklyn 22, N. Y. ADV. PG. 46.
Ⓥ HOULIHAN CO., T. J., 2508-14 W. Lawrence Ave., Chicago, Ill. ADV. PG. 276.
Industrial Equipment Co., Gettysburg, Pa.
Ⓥ INSTRUMENT RESISTORS CO., 1076 Commerce Ave., Union, N. J. ADV. PG. 174, 175.
Ⓥ Johnson Co., E. F., Waseca, Minn.
Ⓥ K-V Transformer Corp., 4414 Park Ave., New York 57, N. Y.
Ⓥ KURMAN ELECTRIC CO., INC., 35-18 37th St., Long Island City 1, N. Y. ADV. PG. 214.
Ⓥ Lenkurt Electric Co., San Carlos, Calif.
Lenz Electronics Corp., 794 E. 140th St., New York 54, N. Y.
Ⓥ Magnetic Devices Corp., 103 S. Van Brunt St., Englewood, N. J.
Ⓥ Magnetic Windings Div., Essex Wire Corp., Freemansburg Ave., & Hobson Blvd., Easton, Pa.
Meissner Mfg. Div., Maguire Industries Inc., Mt. Carmel, Ill.
Ⓥ MEPCO, INC., 55-57 Abbett Ave., Morristown, N. J. ADV. PG. 196.
Ⓥ Miller Mfg. Co., James, 150 Exchange St., Malden, Mass.
Ⓥ Miller Co., J. W., 5917 S. Main St., Los Angeles, Calif.
Ⓥ Molded Insulation Co., Aircraft Control Div., 335 E. Price St., Philadelphia, Pa.
Monroe Coil Co., 2619 N. Narragansett Ave., Chicago 35, Ill.
Peerless Electrical Products Co., 6920 McKinley Ave., Los Angeles 1, Calif.
Ⓥ Phelps Dodge Copper Products Corp., 40 Wall St., New York 5, N. Y.
Ⓥ Precision Corp., 111 Martine Ave., White Plains, N. Y.
Ⓥ Raion Electric Co., 52 E. 19th St., New York 3, N. Y.
Ⓥ Ratex Corp., 2076 N. Elston Ave., Chicago 14, Ill.
Red Arrow Electric Corp., 100 Colt Sta., Irvington 11, N. J.
Reliable Mfg. Co., Hagerstown, Md.
Relton Electrical Co., 8020 S. South Park, Chicago, Ill.
Ⓥ R-N-C Mfg. Co., Inc., Box 277, Dilworth, Wis.
Scintilla Magneto Div. of Bendix Aviation Corp., Sidney, N. Y.
Sickles Co., F. W., P. O. Box 310, Chicopee, Mass.
Siegler Co., Arthur, Refrigerator Div., Evansville, Ind.
Small Motors Inc., 2076 Elston Ave., Chicago 14, Ill.
Ⓥ Speer Resistor Corp., St. Marys, Pa.
Ⓥ SPERRY GYROSCOPE CO., Div. of the Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.
Ⓥ STANDARD COIL PRODUCTS CO., 2329 N. Pulaski Rd., Chicago 39, Ill. ADV. PG. 233.
Ⓥ Standard Electrical Products Co., 402 E. 1st St., Dayton 5, Ohio.
Ⓥ Stanwyck Winding Co., 137 Walsh Ave., Newburg, N. Y.
Ⓥ Stoelle Engineering & Mfg. Co., 3970 S. Grand Ave., Los Angeles 37, Calif.
Super Electric Products Corp., 46 Oliver St., Newark, N. J.
Ⓥ Teleradio Engineering Corp., 99 Wall St., New York, N. Y.
Ⓥ Television Laboratories, Inc., 542 N. Parkside Ave., Chicago 44, Ill.
Ⓥ U. S. ELECTRONICS CORP., 276 Warren St., Lyndhurst, N. J. ADV. PG. 266.
Utah, Inc., E. Franklin St., Huntington, Ind.
Vokar Corp., 7300 Huron River Drive, Dexter, Mich.
Ⓥ Wheeler Insulated Wire Co., Inc., 150 E. Aurora St., Waterbury 91, Conn.

COIL WINDING MACHINES

See Machines—Coil Winding

COIL WINDINGS

Ⓥ A.P.W. Co., 72 W. Main St., Rockaway, N. J.
Ⓥ Acme Wire Co., New Haven 14, Conn.
Aces Products Co., 5330 Baltimore Ave., Philadelphia, Pa.
Aeronautive Equipment Corp., 1632-B Central St., Kansas City 10, Mo.
Ⓥ AEROLITE ELECTRONIC HARDWARE CORP., 507 26th St., Union City, N. J. ADV. PG. 138.
Ⓥ ALLIED CONTROL CO., INC., 2 East End Ave., New York 21, N. Y. ADV. PG. 98, 99.
Ⓥ Allen Lansing Corp., 161 Avenue of the Americas, New York 13, N. Y.
Ⓥ American Relay & Controls Inc., 4901 Flournoy St., Chicago 44, Ill.
Ⓥ Atlas Coil Winders, Inc., Stamford, Conn.
Ⓥ Automatic Mfg. Corp., 65 Gouverneur St., Newark 4, N. J.
Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Bitterman Electric Co., Box 665, Canaan, Conn.
Ⓥ BOND ELECTRONICS CORP., 88 Franklin Place, Summit, N. J. ADV. PG. 250.
Ⓥ Bud Radio, Inc., 2118 E. 55th St., Cleveland 3, Ohio.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ BURNELL & CO., 45 Warburton Ave., Yonkers 2, N. Y. ADV. PG. 59.
Ⓥ Cassell Burns Mfg. Co., 480 Broome St., New York 13, N. Y.
Ⓥ CAMBRIDGE THERMIONIC CORP., 445 Concord Ave., Cambridge, Mass. ADV. PG. 72.
Carron Mfg. Co., 415 S. Aberdeen St., Chicago, Ill.
Coil Winders, Inc., 61 Bergen St., Brooklyn 2, N. Y.
Ⓥ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ Connecticut Telephone & Electric Div., Great American Industries Inc., 70 Britannia St., Meriden, Conn.
Ⓥ Coto-Coil Co., 65 Pavilion Ave., Providence 5, R. I.
Ⓥ DANO ELECTRIC CO., Main St., Winsted, Conn. ADV. PG. 273.
Ⓥ Davis & Co., Dean W., Kentland, Indiana.
Dukakool, Inc., 1010 N. Main St., Elkhart, Ind.
Ⓥ Electron Mfg. Co., 4596 Elston Ave., Chicago, Ill.
Electrical Coil Winding Co., 2733 Saunders St., Camden, N. J.
Ⓥ Electrical Windings, Inc., 2015 N. Kolmar Ave., Chicago 39, Ill.
Ⓥ Electronic Coils, Inc., P. O. Box 1641, 44 Taylor St., Springfield, Mass.
Ⓥ ELECTRONIC DESIGNS, INC., Irvington, N. Y. ADV. PG. 299.
Electronic Engineering Corp., 624 Ridge Rd., Lyndhurst, N. J.
Electronic Indicator Corp., 53 Wyckoff St., Brooklyn, N. Y.
Ⓥ ELECTRONIC TRANSFORMER CO., INC., 215 W. 25th St., New York N. Y. ADV. PG. 316.
Fitzsimons Mfg. Co., Inc., Woods Church Rd., Flemington, N. J.
Ⓥ FERRANTI ELECTRIC, INC., 30 Rockefeller Plaza, New York 20, N. Y. ADV. PG. 81.
Ⓥ FREED TRANSFORMER CO., INC., 1716 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 143.
Gavin Labs., Inc., 2 East End Ave., New York 21, N. Y.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 16.
Ⓥ Gramer Company, The, 2734 N. Pulaski Rd., Chicago 39, Ill.
Gramer Co., Edwin L., 14 S. Throop St., Chicago, Ill.
Ⓥ HIGHLAND ENGINEERING CO., 32 Holman Blvd., Hicksville, N. Y. ADV. PG. 194.
Ⓥ HILLBURN ELECTRONIC PRODUCTS CO., 55 Nassau Ave., Brooklyn 22, N. Y. ADV. PG. 46.
Ⓥ HOULIHAN CO., T. J., 2508-14 W. Lawrence Ave., Chicago 25, Ill. ADV. PG. 276.
Ⓥ I-T-E CIRCUIT BREAKER CO., 19th & Hamilton Sts., Philadelphia 30, Pa. ADV. PG. 40, 41.
Industrial Equipment Co., Gettysburg, Pa.
Ⓥ INSTRUMENT RESISTORS CO., 1076 Commerce Ave., Union, N. J. ADV. PG. 174, 175.
Ⓥ INSULINE CORP. OF AMERICA, 36-02 36th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
Jeffers Electronics Inc., Du Bois, Pa.
Ⓥ Johnson Co., E. F., Waseca, Minn.
Ⓥ K-V Transformer Corp., 4414 Park Ave., New York 57, N. Y.
Ⓥ KURMAN ELECTRIC CO., INC., 35-18 37th St., Long Island City 1, N. Y. ADV. PG. 214.
Ⓥ Lenkurt Electric Co., Inc., San Carlos, Calif.
Leonard Electric Products Co., Inc., 1562 61st St., Brooklyn, N. Y.

Ⓥ Lewis Spring & Mfg. Corp., 2656 W. North Ave., Chicago 47, Ill.
Ⓥ Magnetic Devices Corp., 103 S. Van Brunt St., Englewood, N. J.
Ⓥ Magnetic Instrument Co., 82 W. Main St., West Orange, N. J.
Ⓥ Magnetic Windings Div., Essex Wire Corp., Freemansburg Ave. & Hobson Blvd., Easton, Pa.
Meissner Mfg. Div., Maguire Industries, Inc., Mt. Carmel, Ill.
Ⓥ MEPCO, INC., 35-37 Abbett Ave., Morristown, N. J. ADV. PG. 196.
Ⓥ Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.
Ⓥ Miller Co., J. W., 5917 S. Main St., Los Angeles, Calif.
Molded Insulation Co., Aircraft Control Div., 335 E. Price St., Philadelphia, Pa.
Monroe Coil Co., 2839 N. Narragansett Ave., Chicago 34, Ill.
Ⓥ Polytron Corp., 133 Martine Ave., White Plains, N. Y.
Ⓥ Quality Components, Inc., St. Marys, Pa.
Ⓥ Radex Corp., 2076 N. Elston Ave., Chicago 14, Ill.
Radionic Transformer Co., 411 S. Sangamon St., Chicago 7, Ill.
Ⓥ RAYTHEON MFG. CO., Power Tube Div., Waltham 54, Mass. ADV. PG. 257.
Red Arrow Electric Corp., 100 Coit St., Irvington 11, N. J.
Reisner Mfg. Co., Hagerstown, Md.
Rollan Electrical Co., 8020 S. South Park, Chicago, Ill.
Ⓥ S.N.C. Mfg. Co., Inc., Box 277, Oshkosh, Wis.
Ⓥ SHALLCROSS MFG. CO., 10 Jackson Ave., Collingdale, Pa. ADV. PG. 221.
Sickles Co., F. W., P. O. Box 330, Chicopee, Mass.
Slepian Co., Arthur, Bridgeport, Conn.
Small Motors, Inc., 2076 Elston Ave., Chicago 14, Ill.
Smith Mfg. Co., Nathan R., 105 Pasadena Ave., S. Pasadena, Calif.
Ⓥ Southwestern Industrial Electronic Co., 2831 Post Oak Rd., Houston 19, Texas.
Ⓥ STANDARD COIL PRODUCTS CO., 2329 N. Pulaski Rd., Chicago 39, Ill. ADV. PG. 233.
Ⓥ Standard Electrical Products Co., 402 E. 1st St., Dayton 2, Ohio.
Ⓥ Stanwyck Winding Co., 137 Walsh Ave., Newburgh, N. Y.
Ⓥ Sterling Engineering Co., Laconia, N. H.
Ⓥ Stolle Engineering & Mfg. Co., 3970 S. Grand Ave., Los Angeles 37, Calif.
Ⓥ Teleradio Engineering Corp., 99 Wall St., New York, N. Y.
Ⓥ Television Laboratories, Inc., 542 N. Parkside Ave., Chicago 44, Ill.
Ⓥ Thor Ceramics Inc., 225 Belleville Ave., Bloomfield, N. J.
Ⓥ Triad Transformer Mfg. Co., 2254 Sepulveda Blvd., Los Angeles 64, Calif.
Ⓥ Union Electric Products Co., 24 Edison Pl., Newark 2, N. J.
Ⓥ U. S. ELECTRONICS CORP., 276 Warren St., Lyndhurst, N. J. ADV. PG. 266.
Utah, Inc., E. Franklin St., Huntington, Ind.
Vokar Corp., 7300 Huron River Drive, Dexter, Mich.
Ⓥ WEBSTER SPRING CORP., 176-182 Johnson St., Brooklyn 1, N. Y. ADV. PG. 237, 278.
West Coast Electronics Co., 1601 S. Burlington St., Los Angeles 6, Calif.
Ⓥ Weymouth Instrument Co., 1440 Commercial St., East Weymouth 89, Mass.
Ⓥ Wheeler Insulated Wire Co., Inc., 150 E. Aurora St., Waterbury 91, Conn.

COILS—*Antenna*

Aeromotive Equipment Corp., 1632 R. Central St., Kansas City 10, Mo.
Ⓥ AEROLITE ELECTRONIC HARDWARE CORP., 507 24th St., Union City, N. J. ADV. PG. 138.
Ⓥ Andrew Corp., 363 E. 75th St., Chicago 19, Ill.
Ⓥ Automatic Mfg. Corp., 65 Gouverneur St., Newark 4, N. J.
Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ BOND ELECTRONICS CORP., 89 Franklin Pl., Summit, N. J. ADV. PG. 250.
Ⓥ Caddell-Burns Mfg. Co., 480 Broome St., New York 13, N. Y.
Ⓥ CAMBRIDGE THERMIONIC CORP., 445 Concord Ave., Cambridge, Mass. ADV. PG. 72.
Ⓥ Carron Mfg. Co., 415 S. Aberdeen St., Chicago, Ill.
Ⓥ Hippard Instrument Laboratory, Inc., 1125 Bank St., Cincinnati 14, Ohio.
Coil Winders, Inc., 61 Bergen St., Brooklyn 2, N. Y.
Continental Electronics Mfg. Co., 1728 Wood St., Dallas 1, Texas.
Ⓥ CORNING GLASS WORKS, Corning, N. Y. ADV. PG. 134.
Ⓥ Electronic Coils, Inc., P. O. Box 1641, 44 Taylor St., Springfield, Mass.
Ⓥ ELECTRONIC DESIGNS, INC., Irvington, N. Y. ADV. PG. 194.
Electronic Indicator Corp., 53 Wyckoff St., Brooklyn, N. Y.
Ⓥ ELECTRONIC TRANSFORMER CO., INC., 215 W. 25th St., New York, N. Y. ADV. PG. 116.
Ⓥ Essex Electronics, Berkeley Heights, N. J.
FEDERAL TELEPHONE AND RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.
Guthman Inc., Edwin I., 15 S. Throop St., Chicago, Ill.
Ⓥ HARNETT ELECTRIC CORP., 138 Haven Ave., Port Washington, L. I., N. Y. ADV. PG. 182.
Ⓥ HILLBURN ELECTRONIC PRODUCTS CO., 55 Nassau Ave., Brooklyn 22, N. Y. ADV. PG. 46.
Ⓥ HOULIHAN CO., T. J., 2508-14 W. Lawrence Ave., Chicago, Ill. ADV. PG. 276.
Ⓥ Jeffers Electronics Co., DuBois, Pa.
Ⓥ Johnson Co., E. F., Waseca, Minn.
Leonard Electric Products Co., Inc., 1562 61st St., Brooklyn, N. Y.
Loral Electronics Corp., 794 E. 140th St., New York 54, N. Y.
Meissner Mfg. Div., Maguire Industries, Inc., Mt. Carmel, Ill.
Ⓥ Miller Co., J. W., 5917 S. Main St., Los Angeles, Calif.
Monroe Coil Co., 2839 N. Narragansett Ave., Chicago 34, Ill.
Muter Co., 1255 S. Michigan Ave., Chicago, Ill.
Ⓥ Phelps Dodge Copper Products Corp., 40 Wall St., New York 5, N. Y.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Philmore Mfg. Co., 113 University Place, New York 3, N. Y.
Ⓥ Polytron Corp., 133 Martine Ave., White Plains, N. Y.
Ⓥ Radex Corp., 2076 N. Elston Ave., Chicago 14, Ill.
Sickles Co., F. W., P. O. Box 330, Chicopee, Mass.
Small Motors, Inc., 2076 Elston Ave., Chicago 14, Ill.
Ⓥ STANDARD COIL PRODUCTS CO., 2329 N. Pulaski Rd., Chicago 39, Ill. ADV. PG. 233.
Ⓥ Standard Winding Corp., 44-62 Johnes St., Newburgh, N. Y.
Ⓥ Stanwyck Winding Co., 137 Walsh Ave., Newburgh, N. Y.
Ⓥ Super Electric Products Corp., 46 Oliver St., Newark, N. J.
Ⓥ Teleradio Engineering Corp., 99 Wall St., New York 5, N. Y.
Ⓥ U. S. ELECTRONICS CORP., 276 Warren St., Lyndhurst, N. J. ADV. PG. 266.
Ⓥ WEBSTER SPRING CORP., 176-182 Johnson St., Brooklyn 1, N. Y. ADV. PG. 237, 278.

COILS—*Choke*

Ⓥ A. P. W. Co., 72 W. Main St., Rockaway, N. J.
Ⓥ ACME ELECTRIC CORP., 31 Water St., Cuba, N. Y. ADV. PG. 210.
Ⓥ Acme Wire Co., New Haven 14, Conn.
Acro Products Co., 5330 Baltimore Ave., Philadelphia, Pa.
Ⓥ Acro Transformer Mfg. Corp., 21-20 33rd Ave., Long Island City, N. Y.
Ⓥ AEROLITE ELECTRONIC HARDWARE CORP., 507 24th St., Union City, N. J. ADV. PG. 138.
Ⓥ ALLIED CONTROL CO., INC., 2 East End Ave., New York 21, N. Y. ADV. PG. 98, 99.
Ⓥ Altec Lansing Corp., 161 Avenue of the Americas, New York 13, N. Y.
Ⓥ Audio Development Co., 2833 13th Ave. S., Minneapolis 7, Minn.
Ⓥ Aurex Corp., 1117 N. Franklin St., Chicago, Ill.
Ⓥ Automatic Mfg. Corp., 65 Gouverneur St., Newark 4, N. J.
Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.
Ⓥ Best Mfg. Co., Inc., 1200 Grove St., Irvington 11, N. J.
Bittermann Electric Co., Box 665, Canaan, Conn.
Ⓥ BOND ELECTRONICS CORP., 89 Franklin Place, Summit, N. J. ADV. PG. 250.
Ⓥ Bud Radio, Inc., 2118 E. 55th St., Cleveland 3, Ohio.
Ⓥ BURNELL & CO., 45 Warburton Ave., Yonkers 2, N. Y. ADV. PG. 59.
Ⓥ Caddell-Burns Mfg. Co., 480 Broome St., New York 13, N. Y.
Ⓥ CAMBRIDGE THERMIONIC CORP., 445 Concord Ave., Cambridge, Mass. ADV. PG. 72.
Coil Winders, Inc., 61 Bergen St., Brooklyn 2, N. Y.
Ⓥ COMMUNICATIONS ACCESSORIES CO., Box 445, 110th St. & Hillcrest Rd., Hickman Hills, Mo. ADV. PG. 178.
Ⓥ Continental Electric Co., Inc., 334 Ferry St., Newark 5, N. J.
Ⓥ Coto-Coil Co., Inc., 65 Pavilion Ave., Providence 5, R. I.
Ⓥ Crest Transformer Corp., 1834-36 W. North Ave., Chicago 22, Ill.
Ⓥ DANO ELECTRIC CO., Main St., Winsted, Conn. ADV. PG. 273.
Ⓥ Davis & Co., Dean W., Kentland, Ind.
Ⓥ DeCOURSEY ENGINEERING LAB., P. O. Box 235, Los Angeles 25, Calif. ADV. PG. 254.
Ⓥ Dixson Coil Co., Inc., Caledonia, N. Y.
Ⓥ Electran Mfg. Co., 4496 Elston Ave., Chicago, Ill.
Ⓥ ELECTRICAL REACTANCE CORP., Elm St., Franklinville, N. Y. ADV. PG. 28, 29.
Ⓥ Electrical Windings, Inc., 2015 N. Kolmar Ave., Chicago 39, Ill.
Electricoil Transformer Co., Westerly Rd., Ossining, N. Y.
Electro Engineering Works, 6021 College Ave., Oakland 18, Calif.
Ⓥ Electronic Coils, Inc., P. O. Box 1641, 44 Taylor St., Springfield, Mass.
Ⓥ ELECTRONIC DESIGNS, INC., Irvington, N. Y. ADV. PG. 194.
Ⓥ Electronic Engineering Corp., 624 Ridge Rd., Lyndhurst, N. J.
Ⓥ ELECTRONIC TRANSFORMER CO., INC., 215 W. 25th St., New York, N. Y. ADV. PG. 116.
Empire Coil Co., Inc., 238 Huguenot St., New Rochelle, N. Y.
Ⓥ Essex Electronics, Berkeley Heights, N. J.
Ⓥ FERRANTI ELECTRIC, INC., 30 Rockefeller Plaza, New York 20, N. Y. ADV. PG. 81.
Ⓥ FREED TRANSFORMER CO., INC., 1730 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 143.
Ⓥ Gates Radio Co., Quincy, Ill.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Gramer Co., The, 2734 N. Pulaski Rd., Chicago 39, Ill.
Guthman Inc., Edwin I., 15 S. Throop St., Chicago, Ill.
Ⓥ HARNETT ELECTRIC CORP., 138 Haven Ave., Port Washington, L. I., N. Y. ADV. PG. 182.
Ⓥ HIGHLAND ENGINEERING CO., 92 Holman Blvd., Hicksville, N. Y. ADV. PG. 194.
Ⓥ HILLBURN ELECTRONIC PRODUCTS CO., 55 Nassau Ave., Brooklyn 22, N. Y. ADV. PG. 46.
Ⓥ HOULIHAN CO., T. J., 2508-14 W. Lawrence Ave., Chicago 25, Ill. ADV. PG. 276.
Inductive Equipment Co., Gettysburg, Pa.
Ⓥ INSTRUMENT RESISTORS CO., 1036 Commerce Ave., Union, N. J. ADV. PG. 174, 175.
Ⓥ Jeffers Electronics Co., DuBois, Pa.
Ⓥ Johnson Co., E. F., Waseca, Minn.
Ⓥ K-V Transformer Co., 4414 Park Ave., New York, N. Y.
Ⓥ Lenkurt Electric Co., Inc., San Carlos, Calif.
Leonard Electric Products Co., Inc., 1562 61st St., Brooklyn, N. Y.
Ⓥ Lewis Spring & Mfg. Corp., 2656 W. North Ave., Chicago 47, Ill.
Loral Electronics Corp., 794 E. 140th St., New York 54, N. Y.
Ⓥ Magnetic Instrument Co., 82 W. Main St., West Orange, N. J.
Ⓥ Magnetic Windings Div., Essex Wire Corp., Freemansburg Ave. & Hobson Blvd., Easton, Pa.
Ⓥ Mallory & Co., Inc., P. R., 3029 E. Washington St., Indianapolis 6, Ind.
Meissner Mfg. Div., Maguire Industries Inc., Mt. Carmel, Ill.
Melco Products, Inc., 22 E. Hennepin Ave., Minneapolis 1, Minn.
Ⓥ MEPCO, INC., 35-37 Abbett Ave., Morristown, N. J. ADV. PG. 196.
Ⓥ Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.
Ⓥ Miller Co., J. W., 5917 S. Main St., Los Angeles, Calif.
Monroe Coil Co., 2839 N. Narragansett Ave., Chicago 34, Ill.
Muter Co., 1255 S. Michigan Ave., Chicago, Ill.
Ⓥ NATIONAL CO., INC., 61 Sherman St., Malden 48, Mass. ADV. PG. 33 to 36.
Northern Communications Mfg. Corp., 210 E. 40th St., New York 16, N. Y.
Ⓥ OHMITE MFG. CO., 4835 W. Flournoy St., Chicago 44, Ill. ADV. PG. 83.
Peerless Electrical Products Co., 6920 McKinley Ave., Los Angeles, Calif.
Ⓥ Phelps Dodge Copper Products Corp., 40 Wall St., New York 5, N. Y.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Quality Components, Inc., St. Marys, Pa.
Ⓥ Radex Corp., 2076 N. Elston Ave., Chicago 14, Ill.
Radionic Transformer Co., 411 S. Sangamon St., Chicago 7, Ill.
Ⓥ RAYTHEON MFG. CO., Power Tube Div., Waltham 54, Mass. ADV. PG. 257.
Red Arrow Electric Corp., 100 Coit St., Irvington 11, N. J.
Rollan Electrical Co., 8020 S. South Park, Chicago, Ill.
Ross Mfg. Co., 860 Washington St., Burlington, Iowa.
Ⓥ S. N. C. Mfg. Co., Inc., Box 277, Oshkosh, Wis.
Scintilla Magneto Div. of Bendix Aviation Corp., Sidney, N. Y.
Sickles Co., F. W., P. O. Box 330, Chicopee, Mass.
Slepian Co., Arthur, Bridgeport, Conn.
Small Motors, Inc., 2076 Elston Ave., Chicago 14, Ill.
Ⓥ Southwestern Industrial Electronic Co., 2831 Post Oak Rd., Houston 19, Texas.
Ⓥ SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.
Ⓥ STANDARD COIL PRODUCTS CO., 2329 N. Pulaski Rd., Chicago 39, Ill. ADV. PG. 233.
Ⓥ Standard Electrical Products Co., 402 E. 1st St., Dayton, Ohio.
Ⓥ STANDARD TRANSFORMER CORP., Elston, Kedzie & Addison, Chicago 18, Ill. ADV. PG. 62.
Ⓥ Standard Winding Corp., 44-62 Johnes St., Newburgh, N. Y.
Ⓥ Stanwyck Winding Co., 137 Walsh Ave., Newburgh, N. Y.
Ⓥ Stolle Engineering & Mfg. Co., 3970 S. Grand Ave., Los Angeles 37, Calif.
Ⓥ Super Electric Products Corp., 46 Oliver St., Newark, N. J.

V indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

V Tele-Video Corp., 241 Fairfield Ave., Upper Darby, Pa.
V Teleradio Engineering Corp., 99 Wall St., New York 5, N. Y.
V Thermador Electric Mfg. Co., 5119 District Blvd., Los Angeles 22, Calif.
V Triad Transformer Mfg. Co., 2254 Sepulveda Blvd., Los Angeles 64, Calif.
V Union Electric Products Co., 24 Edison Pl., Newark 2, N. J.
V U. S. ELECTRONICS CORP., 276 Warren St., Lyndhurst, N. J. ADV. PG. 266.
V UNITED TRANSFORMER CO., 150 Varick St., New York 13, N. Y. ADV. PG. Inside Front Cover.
Utah, Inc., E. Franklin St., Huntington, Ind.
Vikar Corp., 7300 Huron River Drive, Dexter, Mich.
V WEBSTER SPRING CORP., 176-182 Johnson St., Brooklyn 1, N. Y. ADV. PG. 237, 278.
V Wheeler Insulated Wire Co., Inc., 150 E. Aurora St., Waterbury 91, Conn.

COILS—*Electronic Heating Inductor*

V Ajax Electrothermic Corp., Ajax Park, Trenton 5, N. J.
V BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
V BOND ELECTRONICS CORP., 88 Franklin Place, Summit, N. J. ADV. PG. 250.
Electronic Heating Co., 146 Glenridge Ave., Montclair, N. J.
V Electronic Engineering Corp., 624 Ridge Rd., Lyndhurst, N. J.
V GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 16.
V High Frequency Heating Co., 143 Glen Park Ave., Gary, Ind.
V HIGHLAND ENGINEERING CO., 32 Holman Blvd., Hicksville, N. Y. ADV. PG. 194.
V Inductotherm Co., Rancocas, Mount.
V K-V Transformer Corp., 4414 Park Ave., New York 57, N. Y.
V Philips Dodge Copper Products Corp., 40 Wall St., New York 5, N. Y.
V Sherman Industrial Electronics Co., 505 Washington Ave., Belleville 9, N. J.
V Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
V Stalle Engineering & Mfg. Co., 3470 S. Grand Ave., Los Angeles 27, Calif.
V U. S. ELECTRONICS CORP., 276 Warren St., Lyndhurst, N. J. ADV. PG. 266.
V WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

COILS—*Flyback*

V Automatic Mfg. Corp., 65 Governeur St., Newark 4, N. J.
V BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
V BOND ELECTRONICS CORP., 88 Franklin Place, Summit, N. J. ADV. PG. 250.
V Bridgeport Instrument Laboratory, Inc., 1125 Bank St., Bridgeport 14, Ohio.
D. X. Radio Products Co., Inc., 2904 Armitage Ave., Chicago, Ill.
V ELECTRONIC TRANSFORMER CO., INC., 215 W. 25th St., New York, N. Y. ADV. PG. 116.
V Esses Electronics, Berkeley Heights, N. J.
V FREED TRANSFORMER CO., INC., 1736 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 149.
Gothman Inc., Edwin J., 15 S. Throop St., Chicago, Ill.
V Magnetic Windings Div., Esses Wire Corp., Freemansburg Ave. & Hobson Blvd., Easton, Pa.
Meissner Mfg. Div., Maguire Industries, Inc., Mt. Carmel, Ill.
Merico Coil Co., 2839 N. Narragansett Ave., Chicago 34, Ill.
V Peerless Corp., Tioga & F Sts., Philadelphia 34, Pa.
V RADIO CORP. OF AMERICA, R & I Lisle Div., Tube Dept., Harrison, N. J. ADV. PG. 74 to 75. Inside Back and Back Covers.
Rola Mfg. Co., 868 Washington St., Burlington, Iowa.
Stokes Co., F. W., P. O. Box 330, Chicopee, Mass.
V Standard Winding Co., 44-62 Johnes St., Newburgh, N. Y.
V Stanwyck Winding Co., 117 Walsh Ave., Newburgh, N. Y.
V Stalle Engineering & Mfg. Co., 3470 S. Grand Ave., Los Angeles 27, Calif.
V Tele-Tron Co., 4014 Prospect Ave., Cleveland 3, Ohio.
V Teleradio Engineering Corp., 99 Wall St., New York 5, N. Y.
V Triad Transformer Mfg. Co., 2254 Sepulveda Blvd., Los Angeles 64, Calif.
V U. S. ELECTRONICS CORP., 276 Warren St., Lyndhurst, N. J. ADV. PG. 266.
Utah, Inc., E. Franklin St., Huntington, Ind.
V WEBSTER SPRING CORP., 176-182 Johnson St., Brooklyn 1, N. Y. ADV. PG. 237, 278.
V Wheeler Insulated Wire Co., Inc., 150 E. Aurora St., Waterbury 91, Conn.

COILS—*Magnet*

V A. P. W. Co., 72 W. Main St., Rockaway, N. J.
V Acme Wire Co., New Haven 14, Conn.
V AEROLITE ELECTRONIC HARDWARE CORP., 507 25th St., Union City, N. J. ADV. PG. 148.
V ALLIED CONTROL CO., INC., 2 East End Ave., New York 21, N. Y. ADV. PG. 98, 99.
V American Relay & Controls, Inc., 4901 W. Flournoy St., Chicago 44, Ill.
Kilmenstone Switch Co., Box 661, Canaan, Conn.
V BOND ELECTRONICS CORP., 88 Franklin Place, Summit, N. J. ADV. PG. 250.
Coil Winders Inc., 61 Bergen St., Brooklyn 2, N. Y.
V Connecticut Telephone & Electric Div., Great American Industries, Inc., 70 Britannia St., Meriden, Conn.
V Coto-Coil Co., Inc., 65 Pavilion Ave., Providence 5, R. I.
V DANO ELECTRIC CO., Main St., Winsted, Conn. ADV. PG. 273.
V Davis & Co., Dean W., Kentland, Ind.
V Electran Mfg. Co., 4596 Elston Ave., Chicago, Ill.
Electrical Coil Winding Co., 2733 Saunders St., Camden, N. J.
V Electrical Windings, Inc., 2015 N. Kolmar Ave., Chicago 39, Ill.
Electronic Transformer Co., Westerly Rd., Deering, N. Y.
Electro Engineering Works, 6021 College Ave., Oakland 18, Calif.
V Electronic Coils, Inc., P. O. Box 1641, 44 Taylor St., Springfield, Mass.
V ELECTRONIC TRANSFORMER CO., INC., 215 W. 25th St., New York, N. Y. ADV. PG. 116.
V FERRANTI ELECTRIC, INC., 30 Rockefeller Plaza, New York 20, N. Y. ADV. PG. 81.
V GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 16.
Gramer Co., The, 2734 N. Pulaski Rd., Chicago 39, Ill.
V Hercules Electric & Mfg. Co., Inc., 2500 Atlantic Ave., Brooklyn 7, N. Y.
V HOULIHAN CO., T. J., 2508-14 W. Lawrence Ave., Chicago 25, Ill. ADV. PG. 276.
Inductive Equipment Co., Gettysburg, Pa.
V KURMAN ELECTRIC CO., INC., 35-18 37th St., Long Island City 1, N. Y. ADV. PG. 214.
Loral Electronics Corp., 794 E. 140th St., New York 54, N. Y.
V Magnetic Devices Corp., 103 S. Van Brunt St., Englewood, N. J.
V Magnetic Windings Div., Esses Wire Corp., Freemansburg Ave., & Hobson Blvd., Easton, Pa.
Meissner Mfg. Div., Maguire Industries, Inc., Mt. Carmel, Ill.
Merico Products, Inc., 22 E. Hennepin Ave., Minneapolis 1, Minn.
V MEPCO, INC., 35-37 Abbett Ave., Morristown, N. J. ADV. PG. 196.
Northern Communications Mfg. Corp., 210 E. 40th St., New York 16, N. Y.
Peerless Electrical Products Co., 6920 McKinley Ave., Los Angeles, Calif.
V Philips Dodge Copper Products Corp., 40 Wall St., New York 5, N. Y.
V Raion Electric Co., 62 E. 19th St., New York 3, N. Y.
Radionic Transformer Co., 411 S. Sangamon St., Chicago 7, Ill.
V RAYTHEON MFG. CO., Power Tube Div., Waltham 54, Mass. ADV. PG. 257.
Red Arrow Electric Corp., 100 Colt St., Irvington 11, N. J.
Reisner Mfg. Co., Hagerstown, Md.
Rollan Electrical Co., 8020 S. South Park, Chicago, Ill.
Scintilla Magneto Div. of Bendix Aviation Corp., Sidney, N. Y.
Stoplan Co., Arthur, Bridgeport, Conn.
V Southwestern Industrial Electronic Co., 2831 Post Oak Rd., Houston 14, Texas.
V STANDARD COIL PRODUCTS CO., 2129 N. Pulaski Rd., Chicago 39, Ill. ADV. PG. 241.
V Stalle Engineering & Mfg. Co., 3470 S. Grand Ave., Los Angeles 27, Calif.
V Super Electric Products Corp., 46 Oliver St., Newark, N. J.
V Teleradio Engineering Corp., 99 Wall St., New York 5, N. Y.
V Union Electric Products Co., 24 Edison Pl., Newark 2, N. J.
V U. S. ELECTRONICS CORP., 276 Warren St., Lyndhurst, N. J. ADV. PG. 266.
Utah, Inc., E. Franklin St., Huntington, Ind.
V Wesmouth Instrument Co., 1440 Commercial St., East Weymouth 89, Mass.
V Wheeler Insulated Wire Co., Inc., 150 E. Aurora St., Waterbury 91, Conn.

COILS—*Motor & Generator Field*

V Acme Wire Co., New Haven 14, Conn.
V Air Associates, Inc., Teterboro, N. J.
Bittermann Electric Co., Box 665, Canaan, Conn.
V Communication Accessories Co., Box 545, 110th St. & Hillcrest Rd., Hickman Mills, Mo. ADV. PG. 278.
V Continental Electric Co., Inc., 334 Ferry St., Newark 5, N. J.
V Coto-Coil Co., Inc., 65 Pavilion Ave., Providence 5, R. I.
V Davis & Co., Dean W., Kentland, Ind.
V Electronic Coils, Inc., P. O. Box 1641, 44 Taylor St., Springfield, Mass.
V ELECTRONIC TRANSFORMER CO., INC., 215 W. 25th St., New York, N. Y. ADV. PG. 116.
V GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 16.
Gramer Co., The, 2734 N. Pulaski Rd., Chicago 39, Ill.
Hose-McCann Telephone Co., Inc., 25th St. & 3rd Ave., Brooklyn 32, N. Y.
V HOULIHAN CO., T. J., 2508-14 W. Lawrence Ave., Chicago 25, Ill. ADV. PG. 276.
V National Electric Coil Co., Columbus 16, Ohio.
Peerless Electrical Products Co., 6920 McKinley Ave., Los Angeles 1, Calif.
V Phelps Dodge Copper Products Corp., 40 Wall St., New York 5, N. Y.
Rollan Electrical Co., 8020 S. South Park, Chicago, Ill.
Stokes Inc., 2026 Elston Ave., Chicago 14, Ill.
V WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
V Wheeler Insulated Wire Co., Inc., 150 E. Aurora St., Waterbury 91, Conn.

COILS—*Multiple Wound*

V A. P. W. Co., 72 W. Main St., Rockaway, N. J.
V Acme Wire Co., New Haven 14, Conn.
Acro Products Co., 5330 Baltimore Ave., Philadelphia, Pa.
V Acro Transformer Mfg. Corp., 21-20 33rd Ave., Long Island City, N. Y.
V ALLIED CONTROL CO., INC., 2 East End Ave., New York 21, N. Y. ADV. PG. 98, 99.
V Aztec Lansing Corp., 161 Avenue of the Americas, New York 13, N. Y.
V American Relay & Controls, Inc., 4901 W. Flournoy St., Chicago 44, Ill.
V Atlas Coil Winders, Inc., Stamford, Conn.
V BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Bittermann Electric Co., Box 665, Canaan, Conn.
V BOND ELECTRONICS CORP., 88 Franklin Place, Summit, N. J. ADV. PG. 250.
Caddell-Burns Mfg. Co., 480 Broome St., New York 13, N. Y.
V CAMBRIDGE THERMIONIC CORP., 445 Concord Ave., Cambridge, Mass. ADV. PG. 72.
Coil Winders, Inc., 61 Bergen St., Brooklyn 2, N. Y.
V Connecticut Telephone & Electric Div., Great American Industries, Inc., 70 Britannia St., Meriden, Conn.
V CORNING GLASS WORKS, Corning, N. Y. ADV. PG. 134.
V Coto-Coil Co., Inc., 65 Pavilion Ave., Providence 5, R. I.
V Crest Transformer Corp., 1834-36 W. North Ave., Chicago 22, Ill.
V DANO ELECTRIC CO., Main St., Winsted, Conn. ADV. PG. 273.
V Davis & Co., Dean W., Kentland, Ind.
V Dixon Coil Co., Inc., Caledonia, N. Y.
V Electran Mfg. Co., 4596 Elston Ave., Chicago, Ill.
V Electrical Windings, Inc., 2015 N. Kolmar Ave., Chicago 39, Ill.
V Electronic Coils, Inc., P. O. Box 1641, 44 Taylor St., Springfield, Mass.
V ELECTRONIC DESIGNS, INC., Irvington, N. Y. ADV. PG. 199.
V ELECTRONIC TRANSFORMER CO., INC., 215 W. 25th St., New York, N. Y. ADV. PG. 116.
Empire Coil Co., Inc., 238 Huguenot St., New Rochelle, N. Y.
V Esses Electronics, Berkeley Heights, N. J.
V Foster Transformer Co., Inc., 3820 Colerain Ave., Cincinnati 23, Ohio.
V FREED TRANSFORMER CO., INC., 1736 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 149.
V Gramer Co., The, 2734 N. Pulaski Rd., Chicago 39, Ill.
V HARNETT ELECTRIC CORP., 138 Haven Ave., Port Washington, L. I., N. Y. ADV. PG. 182.
V HIGHLAND ENGINEERING CO., 32 Holman Blvd., Hicksville, N. Y. ADV. PG. 194.
V HOULIHAN CO., T. J., 2508-14 W. Lawrence Ave., Chicago, Ill. ADV. PG. 276.
V I-T-E CIRCUIT BREAKER CO., 19th & Hamilton Sts., Philadelphia 30, Pa. ADV. PG. 40, 41.
Inductive Equipment Co., Gettysburg, Pa.
V INSTRUMENT RESISTORS CO., 1936 Commerce Ave., Union, N. J. ADV. PG. 174, 175.
V K-V Transformer Corp., 4414 Park Ave., New York 57, N. Y.
V Lenkurt Electric Co., Inc., San Carlos, Calif.
V Magnetic Windings Div., Esses Wire Corp., Freemansburg Ave. & Hobson Blvd., Easton, Pa.
Meissner Mfg. Div., Maguire Industries, Inc., Mt. Carmel, Ill.
Merico Products, Inc., 22 E. Hennepin Ave., Minneapolis 1, Minn.
V MEPCO, INC., 35-37 Abbett Ave., Morristown, N. J. ADV. PG. 196.
V Miller Mfg. Co., James, 150 Exchange St., Malden, Mass.
V Miller Co., B. F., Box 568, Trenton 4, N. J.
Peerless Electrical Products Co., 6920 McKinley Ave., Los Angeles, Calif.
V Phelps Dodge Copper Products Corp., 40 Wall St., New York 5, N. Y.
Radionic Transformer Co., 411 S. Sangamo St., Chicago 7, Ill.
Red Arrow Electric Corp., 100 Colt St., Irvington 11, N. J.
Rollan Electrical Co., 8020 S. South Park, Chicago, Ill.
V S. N. C. Mfg. Co., Inc., Box 277, Dilkoth, Wis.

Scintilla Magneto Div. of Bendix Aviation Corp., Sidney, N. Y.
Ⓥ**SHALLCROSS MFG. CO.**, 10 Jackson Ave., Collingdale, Pa. ADV. PG. 221.
Smith Mfg. Co., Nathan R., 105 Pasadena Ave., So. Pasadena, Calif.
Ⓥ Standard Electrical Products Co., 402 E. 1st St., Dayton, Ohio.
Ⓥ**STANDARD TRANSFORMER CORP.**, Elston, Kedzie & Addison, Chicago 18, Ill. ADV. PG. 62.
Ⓥ Stolle Engineering & Mfg. Co., 3970 S. Grand Ave., Los Angeles 27, Calif.
Ⓥ Super Electric Products Corp., 46 Oliver St., Newark, N. J.
Ⓥ Transformer Engineers, 389 S. Arroyo Parkway, Pasadena, Calif.
Ⓥ Triad Transformer Mfg. Co., 2254 Sepulveda Blvd., Los Angeles 64, Calif.
Ⓥ Union Electric Products Co., 24 Edison Pl., Newark 2, N. J.
Ⓥ**U. S. ELECTRONICS CORP.**, 276 Warren St., Lyndhurst, N. J. ADV. PG. 266.
Ⓥ**UNITED TRANSFORMER CO.**, 150 Varick St., New York 13, N. Y. ADV. PG. Inside Front Cover.
Utah, Inc., E. Franklin St., Huntington, Ind.
Ⓥ**WESTINBHOUSE ELECTRIC CORP.**, P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

COILS—*Pickup*

Ⓥ Phelps Dodge Copper Products Corp., 40 Wall St., New York 5, N. Y.
Ⓥ Super Electric Products Corp., 46 Oliver St., Newark, N. J.

COILS—*Power & a-f Coil Windings*

Ⓥ Acme Wire Co., New Haven 14, Conn.
Acro Products Co., 5330 Baltimore Ave., Philadelphia, Pa.
Ⓥ Acro Transformer Mfg. Corp., 21-20 33rd Ave., Long Island City, N. Y.
Ⓥ**ALLIED CONTROL CO., INC.**, 2 East End Ave., New York 21, N. Y. ADV. PG. 98, 99.
Ⓥ Altec Lansing Corp., 161 Avenue of the Americas, New York 13, N. Y.
Ⓥ**BARKER & WILLIAMSON**, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.
Ⓥ Best Mfg. Co., Inc., 1200 Grove St., Irvington 11, N. J.
Buttermann Electric Co., Box 665, Canaan, Conn.
Ⓥ**BOND ELECTRONICS CORP.**, 88 Franklin Place, Summit, N. J. ADV. PG. 250.
Ⓥ**COMMUNICATION ACCESSORIES CO.**, Box 345, 110th St. & Hillcrest Rd., Hickman Hills, Mo. ADV. PG. 178.
Ⓥ Coto-Coil Co., Inc., 65 Pavilion Ave., Providence 5, R. I.
Ⓥ Davis & Co., Dean W., Kentland, Ind.
Ⓥ Dimon Coil Co., Caledonia, N. Y.
Ⓥ Electran Mfg. Co., 4596 Elston Ave., Chicago, Ill.
Ⓥ Electrical Windings, Inc., 2015 N. Kolmar Ave., Chicago 39, N. Y.
Electricoil Transformer Co., Westerly Rd., Ossining, N. Y.
Ⓥ**ELECTRONIC TRANSFORMER CO., INC.**, 215 West 25th St., New York, N. Y. ADV. PG. 116.
Empire Coil Co., Inc., 238 Huguenot St., New Rochelle, N. Y.
Ⓥ Etrach Mfg. Co., Inc., Woods Church Rd., Flemington, N. J.
Ⓥ**FERRANTI ELECTRIC, INC.**, 30 Rockefeller Plaza, New York 20, N. Y. ADV. PG. 81.
Ⓥ**FREED TRANSFORMER CO., INC.**, 1716 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 143.
Ⓥ Gramer Co., The, 2734 N. Pulaski Rd., Chicago 39, Ill.
Ⓥ**HIGHLAND ENGINEERING CO.**, 32 Holman Blvd., Hicksville, N. Y. ADV. PG. 194.
Industrial Equipment Co., Gettysburg, Pa.
Ⓥ**INSTRUMENT RESISTORS CO.**, 1036 Commerce Ave., Union, N. J. ADV. PG. 174, 175.
Loral Electronics Corp., 794 E. 140th St., New York 54, N. Y.
Ⓥ Magnetic Instrument Co., 82 W. Main St., West Orange, N. J.
Northern Communications Mfg. Corp., 230 E. 40th St., New York 16, N. Y.
Peerless Electrical Products Co., 6920 McKinley Ave., Los Angeles 1, Calif.
Ⓥ Phelps Dodge Copper Products Corp., 40 Wall St., New York 5, N. Y.
Red Arrow Electric Corp., 100 Colt St., Irvington 11, N. J.
Rollan Electrical Co., 8028 S. South Park, Chicago, Ill.
Ⓥ S. N. C. Mfg. Co., Inc., Box 277, Oshkosh, Wis.
Ⓥ**SHALLCROSS MFG. CO.**, 10 Jackson Ave., Collingdale, Pa. ADV. PG. 221.
Small Motors, Inc., 2076 Elston Ave., Chicago 14, Ill.
Ⓥ Southeastern Industrial Electronic Co., 2811 Post Oak Rd., Houston 19, Texas.
Ⓥ Standard Electrical Products Co., 402 E. 1st St., Dayton, Ohio.
Ⓥ**STANDARD TRANSFORMER CORP.**, Elston, Kedzie & Addison, Chicago 18, Ill. ADV. PG. 62.
Ⓥ Stolle Engineering & Mfg. Co., 3970 S. Grand Ave., Los Angeles 27, Calif.
Ⓥ Super Electric Products Corp., 46 Oliver St., Newark, N. J.
Tech-Master Products Co., 443-5 Broadway, New York 13, N. Y.
Ⓥ Tele-Video Corp., 241 Fairfield Ave., Upper Darby, Pa.
Ⓥ Thordarson Electric Mfg. Div., Maguire Industries, Inc., 500 W. Huron St., Chicago 10, Ill.
Ⓥ Triad Transformer Mfg. Co., 2254 Sepulveda Blvd., Los Angeles 64, Calif.
Ⓥ Union Electric Products Co., 24 Edison Pl., Newark 2, N. J.
Ⓥ**UNITED TRANSFORMER CO.**, 150 Varick St., New York 13, N. Y. ADV. PG. Inside Front Cover.
Ⓥ Weymouth Instrument Co., 1440 Commercial St., East Weymouth 89, Mass.
Ⓥ Wheeler Insulated Wire Co., Inc., 150 E. Aurora St., Waterbury 91, Conn.

COILS—*r-f & i-f Receiving or Transmitting*

Aeromotive Equipment Corp., 1632-8 Central St., Kansas City 10, Mo.
Ⓥ**AEROLITE ELECTRONIC HARDWARE CORP.**, 507 26th St., Union City, N. J. ADV. PG. 138.
Associated Production Co., 162 N. Clinton St., Chicago 6, Ill.
Ⓥ Atlas Coil Winders, Inc., Stamford, Conn.
Ⓥ Automatic Mfg. Corp., 65 Gouverneur St., Newark 4, N. J.
Ⓥ**BARKER & WILLIAMSON**, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ**BOND ELECTRONICS CORP.**, 88 Franklin Place, Summit, N. J. ADV. PG. 250.
Ⓥ Bud Radio, Inc., 2118 E. 55th St., Cleveland 3, Ohio.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ Caddell-Burns Mfg. Co., 480 Broome St., New York 13, N. Y.
Ⓥ**CAMBRIDGE THERMIONIC CORP.**, 445 Concord Ave., Cambridge, Mass. ADV. PG. 72.
Ⓥ Carron Mfg. Co., 415 S. Aberdeen St., Chicago, Ill.
Ⓥ Clippard Instrument Laboratory, Inc., 1125 Bank St., Cincinnati 14, Ohio.
Coil Winders Inc., 61 Bergen St., Brooklyn 2, N. Y.
Ⓥ Colling Radio Co., Cedar Rapids, Iowa.
Continental Electronics Mfg. Co., 1728 Wood St., Dallas 1, Texas.
Ⓥ**CORNING GLASS WORKS**, Corning, N. Y. ADV. PG. 134.
Ⓥ Davis & Co., Dean W., Kentland, Ind.
Ⓥ Delco Radio Div., General Motors Corp., Kokomo, Ind.
Dietz Design & Mfg. Co., 5810 Park Ave., Kansas City 4, Mo.
Ⓥ Electronic Coils, Inc., P. O. Box 1641, 44 Taylor St., Springfield, Mass.
Ⓥ**ELECTRONIC DESIGNS, INC.**, Irvington, N. Y. ADV. PG. 199.
Ⓥ Electronic Engineering Corp., 624 Ridge Rd., Lyndhurst, N. J.
Electronic Indicator Corp., 53 Wyckoff St., Brooklyn, N. Y.
Ⓥ Fisher Electronics, Berkeley Heights, N. J.
Ⓥ**FUGLE-MILLER LABORATORIES**, 398 Main St., Metuchen, N. J. ADV. PG. 164.
Ⓥ Gates Radio Co., Quincy, Ill.
Gutzman Inc., Edwin I., 15 S. Throop St., Chicago, Ill.
Ⓥ**HARNETT ELECTRIC CORP.**, 138 Haven Ave., Port Washington, L. I., N. Y. ADV. PG. 182.
Hartley Co., Ltd., H. A., 152 Hammersmith Rd., London W. 6, England.
Ⓥ**HILLBURN ELECTRONIC PRODUCTS CO.**, 55 Nassau Ave., Brooklyn 22, N. Y. ADV. PG. 46.
Ⓥ**HOULIHAN CO., T. J.**, 2508-14 W. Lawrence Ave., Chicago 25, Ill. ADV. PG. 276.
Inductive Equipment Co., Gettysburg, Pa.
Ⓥ**INSTRUMENT RESISTORS CO.**, 1036 Commerce Ave., Union, N. J. ADV. PG. 174, 175.
Ⓥ Jeffers Electronics Inc., DuBois, Pa.
Ⓥ Johnson Co., E. F., Waseca, Minn.
Leonard Electric Products Co., Inc., 1562 61st St., Brooklyn, N. Y.
Ⓥ Lewis Spring & Mfg. Co., 2656 W. North Ave., Chicago 47, Ill.
Loral Electronics Corp., 794 E. 140th St., New York 54, N. Y.
Meissner Mfg. Div., Maguire Industries, Inc., Mount Carmel, Ill.
Ⓥ**MEPCO, INC.**, 35-37 Abbett Ave., Morristown, N. J. ADV. PG. 196.
Ⓥ Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.
Ⓥ Miller Co., J. W., 5917 S. Main St., Los Angeles, Calif.
Monroe Coil Co., 2639 N. Narragansett Ave., Chicago 34, Ill.
Muter Co., 1255 S. Michigan Ave., Chicago, Ill.
Ⓥ**NATIONAL CO., INC.**, 61 Sherman St., Malden 48, Mass. ADV. PG. 33 to 36.
Ⓥ Phelps Dodge Copper Products Corp., 40 Wall St., New York 5, N. Y.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Philmore Mfg. Co., 113 University Place, New York 3, N. Y.
Ⓥ Press Wireless Mfg. Co., Inc., Cantiague Rd., Hicksville, L. I., N. Y.
Ⓥ Quality Components, Inc., St. Marys, Pa.
Ⓥ Radio Condenser Co., Camden, N. J.
Ⓥ**RADIO CORP. OF AMERICA**, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75. Inside Back and Back Covers.
Ross Mfg. Co., 860 Washington St., Burlington, Iowa.
Ⓥ**SHALLCROSS MFG. CO.**, 10 Jackson Ave., Collingdale, Pa. ADV. PG. 221.
Sickles Co., F. W., P. O. Box 330, Chicopee, Mass.
Small Motors, Inc., 2076 Elston Ave., Chicago 14, Ill.
Ⓥ**STANDARD COIL PRODUCTS CO.**, 2329 N. Pulaski Rd., Chicago 39, Ill. ADV. PG. 233.
Ⓥ Standard Winding Corp., 44-62 Johnes St., Newburgh, N. Y.
Ⓥ Stanwyck Winding Co., 137 Walsh Ave., Newburgh, N. Y.
Ⓥ Stolle Engineering & Mfg. Co., 3970 S. Grand Ave., Los Angeles 27, Calif.
Ⓥ Super Electric Products Corp., 46 Oliver St., Newark, N. J.
Ⓥ Teleradio Engineering Corp., 99 Wall St., New York 5, N. Y.
Ⓥ**U. S. ELECTRONICS CORP.**, 276 Warren St., Lyndhurst, N. J. ADV. PG. 266.
Ⓥ**WEBSTER SPRING CORP.**, 176-182 Johnson St., Brooklyn 1, N. Y. ADV. PG. 237, 278.
Ⓥ Weymouth Instrument Co., 1440 Commercial St., East Weymouth 89, Mass.

COILS—*Relay & Solenoid*

See Coils, Magnet

COILS—*Speaker*

Ⓥ**ALLIED CONTROL CO., INC.**, 2 East End Ave., New York 21, N. Y. ADV. PG. 98, 99.
Ⓥ Altec Lansing Corp., 161 Avenue of the Americas, New York 13, N. Y.
Associated Production Co., 162 N. Clinton St., Chicago 6, Ill.
Ⓥ Best Mfg. Co., Inc., 1200 Grove St., Irvington 11, N. J.
Ⓥ**DANO ELECTRIC CO.**, Main St., Winsted, Conn. ADV. PG. 273.
Ⓥ Davis & Co., Dean W., Kentland, Ind.
Ⓥ Electronic Coils, Inc., P. O. Box 1641, 44 Taylor St., Springfield, Mass.
Ⓥ**ELECTRONIC TRANSFORMER CO., INC.**, 215 W. 25th St., New York, N. Y. ADV. PG. 116.
Empire Coil Co., Inc., 238 Huguenot St., New Rochelle, N. Y.
Ⓥ Gramer Company, The, 2734 N. Pulaski Rd., Chicago 39, Ill.
Ⓥ**HOULIHAN COMPANY, T. J.**, 2508-14 W. Lawrence Ave., Chicago 25, Ill. ADV. PG. 276.
Inductive Equipment Co., Gettysburg, Pa.
Ⓥ Magnetic Windings, Div., Essex Wire Corp., Freemansburg Ave. & Hobson Blvd., Easton, Pa.
Ⓥ Molded Insulation Co., Aircraft Control Div., 335 E. Price St., Philadelphia, Pa.
Peerless Electrical Products Co., 6920 McKinley Ave., Los Angeles 1, Calif.
Ⓥ Phelps Dodge Copper Products Corp., 40 Wall St., New York 5, N. Y.
Ⓥ Racon Electric Co., 52 E. 19th St., New York 3, N. Y.
Ⓥ S. N. C. Mfg. Co., Inc., Box 277, Oshkosh, Wis.
Stephens Mfg. Corp., 8538 Warner Drive, Culver City, Calif.
Ⓥ Stevens Products Inc., 6-88 Main St., East Orange, N. J.
Ⓥ U. S. ELECTRONICS CORP., 276 Warren St., Lyndhurst, N. J. ADV. PG. 266.
Utah, Inc., E. Franklin St., Huntington, Ind.

COILS—*Television Focusing*

Ⓥ A P W. Co., 72 W. Main St., Rockaway, N. J.
Associated Production Co., 162 N. Clinton St., Chicago 6, Ill.
Ⓥ**BARKER & WILLIAMSON**, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ Best Mfg. Co., Inc., 1200 Grove St., Irvington 11, N. J.
Coil Winders Inc., 61 Bergen St., Brooklyn 2, N. Y.
Ⓥ Coto-Coil Co., Inc., 65 Pavilion Ave., Providence 5, R. I.
DX Radio Products Co., Inc., 2304 Armitage Ave., Chicago 47, Ill.
Ⓥ Davis & Co., Dean W., Kentland, Ind.
Ⓥ Electronic Coils, Inc., P. O. Box 1641, 44 Taylor St., Springfield, Mass.
Ⓥ**ELECTRONIC TRANSFORMER CO., INC.**, 215 W. 25th St., New York, N. Y. ADV. PG. 116.
Empire Coil Co., Inc., 238 Huguenot St., New Rochelle, N. Y.
Ⓥ Glaser-Steers Corp., 2 Main St., Bellevile 9, N. J.
Gutzman Inc., Edwin I., 15 S. Throop St., Chicago, Ill.
Ⓥ**HARNETT ELECTRIC CORP.**, 138 Haven Ave., Port Washington, L. I., N. Y. ADV. PG. 182.
Ⓥ**HOULIHAN CO., T. J.**, 2508-14 W. Lawrence Ave., Chicago 25, Ill. ADV. PG. 276.
Ⓥ**I-T-E CIRCUIT BREAKER CO.**, 19th & Hamilton Sts., Philadelphia 30, Pa. ADV. PG. 40, 41.

1950-1951 DIRECTORY of

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

Inductive Equipment Co., Gettysburg, Pa.
Ⓥ Magnetic Windings Div., Essex Wire Corp., Freemansburg Ave. & Hobson Blvd., Easton, Pa.
Monroe Coil Co., 2839 N. Narragansett Ave., Chicago 34, Ill.
Peerless Electrical Products Co., 4920 McKinley Ave., Los Angeles 1, Calif.
Ⓥ Phelps Dodge Copper Products Corp., 40 Wall St., New York 5, N. Y.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Rollan Electrical Co., 8020 S. South Park, Chicago 19, Ill.
Ross Mfg. Co., 860 Washington St., Burlington, Iowa.
Ⓥ SMALLCROSS MFG. CO., 10 Jackson Ave., Collingdale, Pa. ADV. PG. 221.
Sprecher Co., Arthur, Bridgeport, Conn.
Ⓥ STANDARD TRANSFORMER CORP., Elston, Kedzie & Addison, Chicago 18, Ill. ADV. PG. 62.
Ⓥ Standard Winding Co., 44-62 Johnes St., Newburgh, N. Y.
Ⓥ Stolle Engineering & Mfg. Co., 3970 S. Grand Ave., Los Angeles 37, Calif.
Ⓥ Super Electric Products Corp., 46 Oliver St., Newark, N. J.
Tech-Master Products Co., 443-5 Broadway, New York 13, N. Y.
Ⓥ Telechron Co., The, 4019 Prospect Ave., Cleveland 3, Ohio.
Ⓥ Teleradio Engineering Corp., 99 Wall St., New York 5, N. Y.
Ⓥ Television Laboratories, Inc., 542 N. Parkside Ave., Chicago 44, Ill.
Ⓥ Triad Transformer Mfg. Co., 2254 Sepulveda Blvd., Los Angeles 64, Calif.
Utah, Inc., E. Franklin St., Huntington, Ind.
Vicker Corp., 7300 Huron River Drive, Dexter, Mich.
Ⓥ Wheeler Insulated Wire Co., Inc., 150 E. Aurora St., Waterbury 91, Conn.

COILS—*Toroidal*

Ⓥ A.P.W. Co., 72 W. Main St., Rockaway, N. J.
Associated Production Co., 162 N. Clinton St., Chicago 6, Ill.
Atlas Coil Winders, Inc., Stamford, Conn.
Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 149.
Bellson Electric Co., Box 665, Canaan, Conn.
Ⓥ BOND ELECTRONICS CORP., 88 Franklin Place, Summit, N. J. ADV. PG. 250.
Ⓥ Bunnell & Co., 45 Warburton Ave., Yonkers 2, N. Y. ADV. PG. 59.
Ⓥ COMMUNICATION ACCESSORIES CO., Box 385, 3100 St. & Hillcrest Rd., Hickman Hills, Missouri. ADV. PG. 178.
Ⓥ Coto-Coil Co., Inc., 65 Pavilion Ave., Providence 5, R. I.
Ⓥ Dx Radio Products Co., Inc., 2554 Armitage Ave., Chicago 47, Ill.
Ⓥ DECOURSEY ENGINEERING LAB., P. O. Box 235, Los Angeles 25, Calif. ADV. PG. 255.
Ⓥ ELECTRONIC TRANSFORMER CO., INC., 215 W. 25th St., New York, N. Y. ADV. PG. 116.
Filtron Co., Inc., The, 38-25 Bell Blvd., Bayside, L. I., N. Y.
Ⓥ Fisher Transformer Co., Inc., 3820 Colerain Ave., Cincinnati 23, Ohio.
Ⓥ FREED TRANSFORMER CO., INC., 1736 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 141.
Gavers Labs., Inc., 2 East End Ave., New York 21, N. Y.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 16.
Ⓥ Haile Co., 11413 Vanowen St., North Hollywood, Calif.
Inductive Equipment Co., Gettysburg, Pa.
Ⓥ Lenkurt Electric Co., Inc., San Carlos, Calif.
Ⓥ Lewis, F. W., 150 2nd St., San Francisco, Calif.
Ⓥ Magnetic Instrument Co., 82 W. Main St., West Orange, N. J.
Ⓥ Manufacturers Engr. & Equip. Corp., Willow Grove, Pa.
Ⓥ Phelps Dodge Copper Products Corp., 40 Wall St., New York 5, N. Y.
Ⓥ Railway Communications, Inc., P. O. Box 2785, Lincoln, Nebr.
Ⓥ Southwestern Industrial Electronic Co., 2811 Post Oak Rd., Houston 19, Texas.
Ⓥ Standard Electrical Products Co., 402 E. 1st St., Dayton, Ohio.
Ⓥ Tinnerman Co., 93-87 Northland Ave., St. Louis 17, Mo.
Ⓥ Transformer Engineers, 389 S. Arroyo Parkway, Pasadena, Calif.
Ⓥ Triad Transformer Mfg. Co., 2254 Sepulveda Blvd., Los Angeles 64, Calif.
Ⓥ UNITED TRANSFORMER CO., 150 Varick St., New York 13, N. Y. ADV. PG. Inside Front Cover.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

COILS—*Transformer Coils & Windings*

Ⓥ A.P.W. Co., 72 W. Main St., Rockaway, N. J.
Ⓥ ACME ELECTRIC CORP., 31 Water St., Cuba, N. Y. ADV. PG. 218.
Ⓥ Alma Wire Co., New Haven 14, Conn.
Ajax Products Co., 5340 Baltimore Ave., Philadelphia, Pa.
Ⓥ Akro Transformer Mfg. Corp., 23-20 43rd Ave., Long Island City, N. Y.
Ⓥ ALLIED CONTROL CO., INC., 2 East End Ave., New York 21, N. Y. ADV. PG. 94, 95.
Ⓥ Altec Lansing Corp., 161 Avenue of the Americas, New York 13, N. Y.
Associated Production Co., 162 N. Clinton St., Chicago 6, Ill.
Ⓥ Atlas Coil Winders, Inc., Stamford, Conn.
Ⓥ Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.
Ⓥ Best Mfg. Co., Inc., 1200 Grove St., Irvington 11, N. J.
Bittermann Electric Co., Box 665, Canaan, Conn.
Ⓥ BOND ELECTRONICS CORP., 88 Franklin Place, Summit, N. J. ADV. PG. 250.
Ⓥ BURNELL & CO., 45 Warburton Ave., Yonkers 2, N. Y. ADV. PG. 59.
Coil Winders, Inc., 61 Bergen St., Brooklyn 2, N. Y.
Ⓥ Coto-Coil Co., Inc., 65 Pavilion Ave., Providence 5, R. I.
Ⓥ Crest Transformer Corp., 1834-36 W. North Ave., Chicago 22, Ill.
Ⓥ DANO ELECTRIC CO., Main St., Winstead, Conn. ADV. PG. 273.
Ⓥ Davis & Co., Dean W., Kentland, Ind.
Ⓥ Delco Radio Div., General Motors Corp., Kokomo, Ind.
Dorsbach, Inc., 1010 N. Main St., Elkhart, Ind.
Ⓥ Eastern Specialty Co., Philadelphia 40, Pa.
Ⓥ Eitel Engineering Co., Inc., 740 S. 13th St., Newark 3, N. J.
Ⓥ Electran Mfg. Co., 4546 Elston Ave., Chicago 30, Ill.
Ⓥ Electrical Windings, Inc., 2015 N. Kolmar Ave., Chicago 39, Ill.
Electrical Transformer Co., Westerly Rd., Division, N. Y.
Ⓥ Electronic Coils, Inc., P. O. Box 1641, 44 Taylor St., Springfield, Mass.
Ⓥ ELECTRONIC DESIGNS, INC., Irvington, N. Y. ADV. PG. 199.
Ⓥ ELECTRONIC TRANSFORMER CO., INC., 215 W. 25th St., New York, N. Y. ADV. PG. 116.
Emcee Coil Co., Inc., 238 Huguenot St., New Rochelle, N. Y.
Ⓥ Esses Electronics, Berkeley Heights, N. J.
Ⓥ Etnico Mfg. Co., Inc., Woods Church Rd., Fleming, Mass.
Ⓥ FERRANTI ELECTRIC, INC., 30 Rockefeller Plaza, New York 20, N. Y. ADV. PG. 81.
Ⓥ FREED TRANSFORMER CO., INC., 1736 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 141.
Gavers Labs., Inc., 2 East End Ave., New York 21, N. Y.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 16.
Ⓥ Gramer Co., The, 2734 N. Pulaski Rd., Chicago 39, Ill.
Ⓥ Hercules Electric & Mfg. Co., Inc., 2500 Atlantic Ave., Brooklyn 7, N. Y.
Ⓥ HIGHLAND ENGINEERING CO., 32 Holman Blvd., Hicksville, N. Y. ADV. PG. 194.
Ⓥ HOULIHAN CO., T. J., 2508-14 W. Lawrence Ave., Chicago 25, Ill. ADV. PG. 276.
Inductive Equipment Co., Gettysburg, Pa.
Ⓥ K-V Transformer Corp., 4414 Park Ave., New York 57, N. Y.
Ⓥ Lenkurt Electric Co., Inc., San Carlos, Calif.
Leonard Electric Products Co., Inc., 1562 61st St., Brooklyn 19, N. Y.
Ⓥ Magnetic Instrument Co., 82 W. Main St., West Orange, N. J.
Ⓥ Magnetic Windings Div., Essex Wire Corp., Freemansburg Ave. & Hobson Blvd., Easton, Pa.
Meissner Mfg. Div., Maguire Industries, Inc., Mt. Carmel, Ill.
Melco Products, Inc., 22 E. Hennepin Ave., Minneapolis 1, Minn.
Ⓥ Miller Co., B. F., P. O. Box 568, Trenton 4, N. J.
Northern Communications Mfg. Corp., 210 E. 40th St., New York 16, N. Y.
Ⓥ Nitheiler Winding Labs., 9 Albemarle Ave., Trenton 9, N. J.
Peerless Electrical Products Co., 4920 McKinley Ave., Los Angeles 1, Calif.
Ⓥ Phelps Dodge Copper Products Corp., 40 Wall St., New York 5, N. Y.
Ⓥ Progressive Welder Co., 3050 E. Outer Drive, Detroit, Mich.
Radionic Transformer Co., 411 S. Sangamon St., Chicago 7, Ill.
Ⓥ RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 267.
Red Arrow Electric Corp., 106 Colt St., Irvington 11, N. J.
Rollan Electrical Co., 8020 S. South Park, Chicago, Ill.
Ⓥ S. N. C. Mfg. Co., Inc., Box 277, Oshkosh, Wis.
Scintilla Magneto Div. of Bendix Aviation Corp., Sidney, N. Y.
Sleeper Co., Arthur, Bridgeport, Conn.
Smith Mfg. Co., Nathan H., 105 Pasadena Ave., S. Pasadena, Calif.
Ⓥ Southwestern Industrial Electronic Co., 2811 Post Oak Rd., Houston 19, Texas.
Ⓥ SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.
Ⓥ Standard Electrical Products Co., 402 E. 1st St., Dayton, Ohio.
Ⓥ STANDARD TRANSFORMER CORP., Elston, Kedzie & Addison, Chicago 18, Ill. ADV. PG. 62.
Ⓥ Stolle Engineering & Mfg. Co., 3970 S. Grand Ave., Los Angeles 37, Calif.
Ⓥ Super Electric Products Corp., 46 Oliver St., Newark, N. J.
Tech-Master Products Co., 443-5 Broadway, New York 13, N. Y.
Ⓥ Teleradio Engineering Corp., 99 Wall St., New York 5, N. Y.
Ⓥ Television Laboratories, Inc., 542 N. Parkside Ave., Chicago 44, Ill.
Ⓥ Ther Electric & Machine Works, 15 S. Jefferson St., Chicago, Ill.
Ⓥ Thermador Electric Mfg. Co., 5119 District Blvd., Los Angeles 22, Calif.
Ⓥ Thordarson Electric Mfg. Div., Maguire Industries, Inc., 500 W. Huron St., Chicago 10, Ill.
Ⓥ Transformer Engineers, 389 S. Arroyo Parkway, Pasadena, Calif.
Ⓥ Triad Transformer Mfg. Co., 2254 Sepulveda Blvd., Los Angeles 64, Calif.
Ⓥ Unicon Electric Products Co., 24 Edison Pl., Newark 2, N. J.
Ⓥ U. S. ELECTRONICS CORP., 276 Warren St., Lyndhurst, N. J. ADV. PG. 266.
Ⓥ UNITED TRANSFORMER CO., 150 Varick St., New York 13, N. Y. ADV. PG. Inside Front Cover.
Utah, Inc., E. Franklin St., Huntington, Ind.
Ⓥ Wentworth Instrument Co., 1440 Commercial St., East Weymouth 89, Mass.
Ⓥ Wheeler Insulated Wire Co., Inc., 150 E. Aurora St., Waterbury 91, Conn.

COILS—*Width Control*

Ⓥ AEROLITE ELECTRONIC HARDWARE CORP., 107 26th St., Union City, N. J. ADV. PG. 138.
Ⓥ BOND ELECTRONICS CORP., 88 Franklin Place, Summit, N. J. ADV. PG. 250.
Ⓥ Caldwell-Burns Mfg. Co., 480 Broome St., New York 13, N. Y.
Ⓥ Clippard Instrument Laboratory, Inc., 1125 Bank St., Cincinnati 14, Ohio.
Coil Winders, Inc., 61 Bergen St., Brooklyn 2, N. Y.
Ⓥ Electronic Coils, Inc., P. O. Box 1641, 44 Taylor St., Springfield, Mass.
Ⓥ ELECTRONIC DESIGNS, INC., Irvington, N. Y. ADV. PG. 199.
Ⓥ ELECTRONIC TRANSFORMER CO., INC., 215 W. 25th St., New York, N. Y. ADV. PG. 116.
Ⓥ Esses Electronics, Berkeley Heights, N. J.
Guttman Inc., Edwin J., 15 S. Throop St., Chicago, Ill.
Ⓥ HILLBURN ELETRONIC PRODUCTS CO., 55 Nassau Ave., Brooklyn 22, N. Y. ADV. PG. 44.
Ⓥ HOULIHAN CO., T. J., 2508-14 W. Lawrence Ave., Chicago 25, Ill. ADV. PG. 276.
Ⓥ I-T-E CIRCUIT BREAKER CO., 19th & Hamilton St., Philadelphia 30, Pa. ADV. PG. 40, 41.
Leonard Electric Products Co., Inc., 1562 61st St., Brooklyn, N. Y.
Meissner Mfg. Div., Maguire Industries Inc., Mt. Carmel, Ill.
Miller Co., 1255 S. Michigan Ave., Chicago, Ill.
Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 76. Inside Back and Back Covers.
Ross Mfg. Co., 860 Washington St., Burlington, Iowa.
Scales Co., F. W., P. O. Box 330, Chicopee, Mass.
Ⓥ Standard Coil Products Co., 2329 N. Pulaski Rd., Chicago 39, Ill. ADV. PG. 233.
Ⓥ Standard Winding Co., 44-62 Johnes St., Newburgh, N. Y.
Ⓥ Wentworth Winding Co., 137 Walsh Ave., Newburg, N. Y.
Ⓥ Stolle Engineering & Mfg. Co., 3970 S. Grand Ave., Los Angeles 37, Calif.
Ⓥ Teleradio Engineering Corp., 99 Wall St., New York 5, N. Y.
Ⓥ Telechron Co., 4019 Prospect Ave., Cleveland 3, Ohio.
Ⓥ U. S. ELECTRONICS CORP., 276 Warren St., Lyndhurst, N. J. ADV. PG. 266.
Utah, Inc., E. Franklin St., Huntington, Ind.

COLORIMETERS—*Photoelectric*

American Instrument Co., 8030 Georgia Ave., Silver Spring, Md.
Ⓥ Associated Research, Inc., 3758 W. Belmont, Chicago 18, Ill.
Ⓥ Bausch-Lomb Optical Co., 1546 Second Ave., New York 26, N. Y.
Ⓥ Coleman Instruments, Inc., 318 Madison St., Maywood, Ill.
Ⓥ Fairchild Optical Co., Inc., Bronx Blvd. at 238th St., New York 66, N. Y.
Ⓥ Fisher Scientific Co., 717 Forbes St., Pittsburgh 19, Pa.
Ⓥ Gardner Lab., Inc., Henry A., 4723 Elm St., Bethesda 14, Md.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 16.
Harshaw Scientific Div. of The Harshaw Chemical Co., 1945 E. 97th St., Cleveland 6, Ohio.
Ⓥ INSTRUMENT DEVELOPMENT LABORATORIES, INC., Needham Heights, Mass. ADV. PG. 249.
Ⓥ Photron Instrument Co., 6516 Detroit Ave., Cleveland, Ohio.
Photowatt Corp., 95 Madison Ave., New York 16, N. Y.
Ⓥ Rubicon Co., 3751 Ridge Ave., Philadelphia, Pa.
Sherson Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

COLUMBIUM

See Metals

COMMUNICATION SYSTEMS

1. **Aircraft**
2. **Airport Traffic Control**
3. **Carrier Current**
4. **Facsimile**
5. **Induction**
6. **Marine Radio-Telephone**
7. **Microwave**
8. **Portable Installation**
9. **Radioteletype**
10. **Railroad**
11. **Vehicular**

Ⓥ Acme Telectronix Div. of NEA Service Inc., West Third & Lakeside, Cleveland 14, Ohio. 4.
Aeromotive Equipment Corp., 1632-8 Central St., Kansas City, Mo. 1.
Ⓥ Aeronautical Communications Equipment, Inc., 3090 Douglas Rd., Miami 33, Fla. 1.
Ⓥ Aeronautical Radio Mfg. Co., 155 First St., Mineola, N. Y. 1.
Ⓥ Air Associates, Inc., Teterboro, N. J. 1.
Ⓥ AIRCRAFT RADIO CORP., Boonton, N. J. 1. ADV. PG. 198, 199.
Ⓥ ALDEN PRODUCTS CO., 117 N. Main St., Brockton 64, Mass. 4. ADV. PG. 235.
American Communications Corp., 306 Broadway, New York 7, N. Y. 3.
American Electroneering Co., 2112 S. La Brea Ave., Los Angeles, Calif. 1-2-6-7-8-10-11.
Ⓥ Applied Electronics Co., 1246 Folsom St., San Francisco 3, Calif. 6.
Arlington Electric Products Inc., 500 W. 52nd St., New York 19, N. Y. 2.
Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. 4-9-11. ADV. PG. 164.
Bassett Inc., Rex, 307-11 N.W. 1st Ave., Ft. Lauderdale, Fla. 1-2-6.
Ⓥ Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md. 1-2-7-9-10-11.
Bunnell & Co., J. H., 215 Fulton St., New York, N. Y. 1-2-3-4-6-7-8-9-10.
Ⓥ Capehart-Farnsworth Corp., Fort Wayne, Indiana. 10.
Ⓥ Carnine & Bitter, 2332 Ontario Rd., N.W., Washington 9, D. C. 7.
Ⓥ Collins Radio Co., Cedar Rapids, Iowa. 1-2-6-8-11.
Ⓥ Communications Co., Inc., 300 Greco Ave., Coral Gables 34, Fla. 1-2-6-8-9-10-11.
Ⓥ Consor (Canada) Ltd., 301-303 Windsor St., Halifax, N. S., Canada. 2.
Ⓥ Doolittle Radio, Inc., 7421 S. Loomis Blvd., Chicago 36, Ill. 8-11.
Ⓥ ELECTRONIC MEASUREMENTS CO., Red Bank, N. J. 7-11. ADV. PG. 139.
Ⓥ EL-TRONICS, INC., 2649 N. Howard St., Philadelphia 33, Pa. 2-3-6. ADV. PG. 238.
Erco Radio Labs., Inc., East Stewart Ave., Garden City, N. Y. 2-6-8-9.
Espey Mfg. Co., Inc., 528 E. 72nd St., New York, N. Y. 4.
Ⓥ Fairchild Recording Equipment Corp., 154 St. & 7th Ave., Whitestone, N. Y. 1-4-8.
Ⓥ Federal Telecommunication Labs., Inc., 500 Washington Ave., Nutley, N. J. 7.
Ⓥ FEDERAL TELEPHONE & RADIO CORP., 100 Kingsland Rd., Clifton, N. J. 2-3-7-11. ADV. PG. 24 to 29.
Ⓥ Feller Engineering Co., 1601 S. Federal St., Chicago 16, Ill. 8.
Ⓥ Finch Telecommunications, Inc., Passaic, N. J. 4.
Ⓥ Gates Radio Co., Quincy, Ill. 2-6.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. 3. ADV. PG. 5 to 18.
Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. 1-3-6-7-8-11. ADV. PG. 5 to 18.
Ⓥ Godfrey Mfg. Co., 171 S. 2nd St., Milwaukee 4, Wis. 8.
Grady Instrument Co., 689 Belmont St., Belmont 78, Mass. 6-11.
Ⓥ Gray Radio Co., 501 Forest Hill Blvd., W. Palm Beach, Fla. 6.
Hart & Co., Inc., Frederick, 839 Main Ave., Poughkeepsie, N. Y. 2-8-10.
Ⓥ HARVEY RADIO LABS., INC., 447 Concord Ave., Cambridge, Mass. 11. ADV. PG. 104.
Ⓥ Horne Laboratories, Inc., 155 Perry St., New York 14, N. Y. 4.
Hose-McCann Telephone Co., Inc., 25th St. & 3rd Ave., Brooklyn 32, N. Y. 6.
Ⓥ Ifrenergy Corp., 2701 California Ave., Seattle 6, Wash. 6.
Jarvis Electronics Corp., 6058 W. Fullerton Ave., Chicago 39, Ill. 1.
Ⓥ Kear Engineering Co., 2995 Middlefield Road, Palo Alto, Calif. 4-11.
Ⓥ Kellogg Switchboard & Supply Co., 6650 S. Cicero Ave., Chicago 38, Ill. 1-3.
Ⓥ Lenkurt Electric Co., Inc., San Carlos, Calif. 3.
Ⓥ Link Radio Corp., 125 W. 17th St., New York, N. Y. 3-11.
Local Electronics Corp., 794 E. 140th St., New York 54, N. Y. 1.
Ⓥ Lynch Co., F. W., 151 2nd St., San Francisco, Calif. 3.
Ⓥ McElroy Mfg. Corp., Littleton, Mass. 4-9.
Ⓥ Mitchell Industries, Inc., Camp Wolters, Mineral Wells, Texas. 1.
Ⓥ MUIRHEAD & CO., LTD., Beckman-Kent-England. 4. ADV. PG. 71.
Northeastern Engineering Inc., Manchester, N. H. 2.
Ⓥ Northern Radio Co., 314 Bell St., Seattle 1, Wash. 6.
Ⓥ NORTHERN RADIO CO., INC., 143-145 W. 22nd St., New York 11, N. Y. 1-3-4-5-6-9-10-11. ADV. PG. 132, 133.
Ⓥ Philco Corp., Tioga & C Streets, Philadelphia 34, Pa. 4-7-10-11.
Plastics & Electronics Co., 272 Northland Ave., Buffalo 8, N. Y. 8.
Ⓥ Polarad Electronics Corp., 100 Metropolitan Ave., Brooklyn 11, N. Y. 7.
Ⓥ Press Wireless Mfg. Co., Inc., Cantiague Rd., Hicksville, L. I., N. Y. 1-2-4-7-9.
Ⓥ Racon Electric Co., 52 E. 19th St., New York 3, N. Y. 1-6-10.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., Camden, N. J., General Offices. 1-7-11. ADV. PG. 73 to 75. Inside Back and Back Covers.
Ⓥ RADIO FREQUENCY LABS., INC., Boonton 2, N. J. 9. ADV. PG. 172.
Radio Specialty Mfg. Co., 2023 S. E. Sixth Ave., Portland 14, Ore. 8-11.
Ⓥ Radiomarine Corp. of America, 75 Varick St., New York 13, N. Y. 6.
Ⓥ Railway Communications, Inc., P. O. Box 1783, Lincoln, Nebr. 3.
RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. 6-7-9-10-11. ADV. PG. 257.
Ripley Co., Inc., P. O. Box 31, Middletown, Conn. 1.
Ⓥ Rosen Engineering Products, Inc., Raymond, 32nd & Walnut Sts., Philadelphia 4, Pa. 7-8-9.
Schuttig & Co., Inc., 9th & Kearney Sts., N. E., Washington 17, D. C. 9.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y. 1-2-3-6-7-8-11.
Smuckler & Co., Inc., A. F., 202 Tillary St., Brooklyn 1, N. Y. 1-2-3-5-8-11.
Ⓥ Speak-O-Phone Recording & Equipment Co., 23 W. 60th St., New York, N. Y. 5.
Ⓥ SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. 1-2-7. ADV. PG. 85, 86.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England. 1-2-3-6-7-9-10.
Ⓥ Submarine Signal Div., Raytheon Mfg. Co., Waltham, Mass. 6.
Ⓥ Technical Materiel Corp., The, 453 W. 47th St., New York 19, N. Y. 9.
Telephonics Corp., Park Ave., Huntington, N. Y. 1.
Ⓥ TIMES FACSIMILE CORP., 229 W. 43rd St., New York 18, N. Y. 4. ADV. PG. 50.
Ⓥ Tranmitter Equipment Co., Inc., 345 Hudson St., New York 14, N. Y. 1-2-8-11.
Ⓥ U. S. Instrument Corp., 409 Broad St., Summit, N. J. 8-10.
Ⓥ Webster Electric Co., 1900 Clark St., Racine, Wis. 10.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. 2-3-6-7-9-10-11. ADV. PG. 77.
Ⓥ Weymouth Instrument Co., 1440 Commercial St., East Weymouth 89, Mass. 7.
Ⓥ Wilcox Electric Co., 1400 Chestnut St., Kansas City, Mo. 1-2.

COMPARATORS—*Automatic Resistance*

Applied Science Corp. of Princeton, The, P. O. Box 44, Princeton, N. J.
Ⓥ Clevite Instrument Laboratory, Inc., 1125 Bank St., Cincinnati 14, Ohio.
Ⓥ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ FREED TRANSFORMER CO., INC., 1736 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 143.
Ⓥ Industrial Instruments Inc., 17 Pollack Ave., Jersey City 5, N. J.

COMPARATORS, CIRCUIT LINEARITY

Ⓥ Daven Laboratories, Inc., 4705 Queensbury Rd., Riverdale, Md.

COMPARATORS—*Crystal*

Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 164.
Monitor Products Co., 815 Fremont St., So. Pasadena, Calif.
Ⓥ PANORAMIC RADIO PRODUCTS, INC., 10 South Second Ave., Mt. Vernon, N. Y. ADV. PG. 270.
Scherr Co., Inc., George, 200 Lafayette St., New York 12, N. Y.

COMPARATORS, SURFACE

See Analyzers, Surface

COMPASSES—*Electronic Gyro*

Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schnectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ SPERRY GYROSCOPE CO., Div of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.
Ⓥ VECTRON, INC., 235 High St., Waltham, Mass. ADV. PG. 266.

COMPUTERS, ELECTRONIC

See Machines

CONDENSERS

See Capacitors

CONES, METAL TV

Ⓥ DeLaval Separator Co., 165 Broadway, New York 6, N. Y.
Ⓥ I-T-E CIRCUIT BREAKER CO., 19th & Hamilton Sts., Philadelphia 30, Pa. ADV. PG. 40, 41.
Ⓥ Milwaukee Metal Spinning Co., 4128 W. State St., Milwaukee 8, Wis.

CONES—*Speaker*

Ⓥ Carron Mfg. Co., 415 S. Aberdeen St., Chicago, Ill.
Ⓥ Hawley Products Co., St. Charles, Ill.
Kling Metal Spinning Co., 174 Centre St., New York 13, N. Y.
Ⓥ Racon Electric Co., 52 E. 19th St., New York 3, N. Y.
Ⓥ Stevens Products Inc., 86-88 Main St., East Orange, N. J.

CONNECTORS—*Cable Connectors & Couplings*

Ⓥ AIRTRON INC., 101 E. Elizabeth Ave., Linden, N. J. ADV. PG. 46.
Ⓥ ALDEN PRODUCTS CO., 117 North Main St., Brockton 64, Mass. ADV. PG. 235.
Ⓥ Aluminum Co. of America, Gulf Bldg., Pittsburgh, Pa.
Ⓥ Ark-Les Switch Corp., 55 Water St., Watertown 72, Mass.
Ⓥ Astatic Corp., The, Conneaut, Ohio.
Ⓥ ATOMIC INSTRUMENT CO., 160 Charles St., Boston, Mass. ADV. PG. 218.
Ⓥ AVIOMETER DIV. OF ROANWELL CORP., 662 Pacific St., Brooklyn 17, N. Y. ADV. PG. 66.
Ⓥ BREEZE CORPNS., INC., 41 S. Sixth St., Newark 7, N. J. ADV. PG. 93.
Ⓥ BUCHANAN ELECTRICAL PRODUCTS CORP., 1290 Central Ave., Hillside, N. J. ADV. PG. 214.
Bud Radio, Inc., 2118 E. 55th St., Cleveland 3, Ohio.
Ⓥ Buggie & Co., H. H., 726 Stanton St., Toledo, Ohio.
Ⓥ Burndy Engineering Co., Inc., 107 Bruckner Blvd., New York 54, N. Y.
Ⓥ Cannon Electric Development Co., 3209 Humboldt St., Los Angeles 31, Calif.
Ⓥ CINCH MFG. CORP., 1026 S. Homan Ave., Chicago 24, Ill. ADV. PG. 154.
Cole-Hersee Co., 20 Old Colony Ave., Boston 27, Mass.
Ⓥ Commercial Radio Sound Corp., 575 Lexington Ave., New York 22, N. Y.
Ⓥ Connecticut Telephone & Electric Div., Great American Industries, Inc., 70 Britannia St., Meriden, Conn.
Ⓥ Dante Electric Mfg. Co., Bantam, Conn.
Ⓥ DIAL LIGHT CO. OF AMERICA, 900 Broadway, New York 3, N. Y. ADV. PG. 50.
Ⓥ Diamond Mfg. Co., Wakefield, Mass.
Ⓥ Elco Mfg. Co. Div. of Electro-Connector Corp., 110 W. Oxford St., Phila. 22, Pa.
Ⓥ Frankel Connector Co., 177 Hudson St., New York, N. Y.
Ⓥ Franklin Mfg. Corp., A. W., 43-20 34th St., Long Island City, N. Y.
Ⓥ General R F Fittings Co., 126 Dartmouth St., Boston 16, Mass.
Ⓥ GENERAL ELECTRIC CO., Construction Materials Dept. 1285 Boston Ave., Bridgeport 2, Conn. ADV. PG. 5 to 18.
Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Ⓥ Hallett Mfg. Co., 1601 Florence Ave., Inglewood, Calif.
Ⓥ Hilco Copper Tube & Products Inc., Mariemont Ave., Mariemont, Cincinnati 27, Ohio.
Ⓥ INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
Ⓥ Johnson Co., E. F., Waseca, Minn.
Ⓥ JONES, DIV., HOWARD B., Cinch Mfg. Corp., 1026 S. Homan Ave., Chicago 24, Ill. ADV. PG. 155.
Ⓥ Kulton Electric Mfg. Co., 123 New Jersey Railroad Ave., Newark 5, N. J.
Ⓥ Locke Incorporated, P. O. Box 57, Baltimore 3, Md.
Ⓥ Miraeta Fabricators, Inc., 5324 Ravenswood Ave., Chicago 40, Ill.
Ⓥ Mines Equipment Division, Joy Mfg. Co., 4235 Clayton Ave., St. Louis, Mo.
Ⓥ Mitnic Co., Frank W., 1300 Soldiers Field Rd., Boston 35, Mass.
National Electrical Machine Shops, Inc., 919 Jesup-Blair Drive, Silver Spring, Md.

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

Ⓥ North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
Reno Union Electric Corp., 315 State Street, Erie, Pa.
Ⓥ Product Development Co., Inc., Arlington, N. J.
Ⓥ Rattan Mfg. Co., The, New Haven 7, Conn.
Ⓥ Remler Co., Ltd., 2101 Bryant St., San Francisco 10, Calif.
Ⓥ Rixon, Inc., 716 W. Wilson Ave., Glendale 1, Calif.
Ⓥ RUSSELL & STOLL CO., INC., 125 Barclay St., New York 7, N. Y. ADV. PG. 231.
Ⓥ Scintilla Magneto Div. of Bendix Aviation Corp., Sidney, N. Y.
Selectar Industries, Inc., 401 East 138th St., New York 54, N. Y.
Ⓥ Sherman Mfg. Co., H. B., 22 Barney St., Battle Creek, Mich.
Ⓥ Thomas & Betts Co., Inc., 36 Butler St., Elizabeth 1, N. J.
Ⓥ U. S. Rubber Co., 1230 Avenue of the Americas, New York 20, N. Y.
Ⓥ Wade Electric Products Co., 211 Jacob St., Sturgis, Mich.
Ⓥ Weymouth Instrument Co., 1440 Commercial St., East Weymouth 89, Mass.
Ⓥ Whitaker Cable Corp., Kansas City 16, Mo.
Ⓥ WINCHESTER ELECTRONICS, INC., Glenbrook, Conn. ADV. PG. 201.

CONNECTORS—*Ceramic Cable*

Ⓥ AIRCRAFT RADIO CORP., Boonton, N. J. ADV. PG. 199.
Ⓥ CENTRALAB, Div. of Globe Union Inc., 900 E. Keefe Ave., Milwaukee 1, Wis. ADV. PG. 64, 65.
Ⓥ Diamond Mfg. Co., Wakefield, Mass.
Ⓥ GENERAL CERAMICS & STEATITE CORP., Keasbey, N. J. ADV. PG. 219.
Ⓥ Johnson Co., E. F., Waseca, Minn.
Ⓥ STUPAKOFF CERAMIC & MFG. CO., Latrobe, Pa. ADV. PG. 147.

CONNECTORS—*Coaxial Cable*

Ⓥ AIRTRON, INC., 101 E. Elizabeth Ave., Linden, N. J. ADV. PG. 46.
Ⓥ ALDEN PRODUCTS CO., 117 No. Main St., Brockton 64, Mass. ADV. PG. 235.
Ⓥ AMERICAN PHENOLIC CORPORATION, 1830 S. 54th Ave., Chicago 50, Ill. ADV. PG. 191.
Ⓥ Andrew Corp., 363 E. 75th St., Chicago 19, Ill.
Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ Brach Mfg. Corp., 200 Central Ave., Newark 4, N. J.
Ⓥ Bugle & Co., H. H., 726 Stanton St., Toledo, Ohio.
Ⓥ Hundy Engineering Co., Inc., 107 Brukner Blvd., New York 54, N. Y.
Ⓥ Jamon Electric Development Co., 1209 Humbolt St., Los Angeles 31, Calif.
Ⓥ Diamond Mfg. Co., Wakefield, Mass.
Ⓥ General R-F Fittings Co., 126 Dartmouth St., Boston 16, Mass.
Ⓥ GENERAL RADIO CO., 235 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Ⓥ Herrold Electronics Corp., 121 N. Broad St., Philadelphia, Pa.
Ⓥ JONES ELECTRONICS CO., M. C., Bristol, Conn. ADV. PG. 198.
Ⓥ JONES DIV. HOWARD B., Cinch Mfg. Corp., 1026 S. Homan Ave., Chicago 24, Ill. ADV. PG. 155.
Ⓥ Kings Electronics Co., Inc., 811 Lexington Ave., Brooklyn 21, N. Y.
Ⓥ Mines Equipment Division, Joy Mfg. Co., 4235 Clayton Ave., St. Louis, Mo.
Ⓥ Mallard Insulation Co., Aircraft Control Div., 335 E. Price St., Philadelphia, Pa.
National Electrical Machine Shops, Inc., 919 Jesup-Blair Drive, Silver Spring, Md.
Ⓥ Product Development Co., Inc., Arlington, N. J.
Ⓥ Rixon, Inc., 716 W. Wilson Ave., Glendale 1, Calif.
Ⓥ Scintilla Magneto Div. of Bendix Aviation Corp., Sidney, N. Y.
Selectar Industries, Inc., 401 E. 138th St., New York 54, N. Y.
Ⓥ Shevers, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.
Ⓥ SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ Thomas & Betts Co., Inc., 36 Butler St., Elizabeth 1, N. J.
Ⓥ Transradio Ltd., 138A Cromwell Rd., London S. W. 7, England.
Ⓥ Weymouth Instrument Co., 1440 Commercial St., East Weymouth 89, Mass.
Ⓥ Workshop Associates Inc., The, 66 Needham St., New Ton Highlands 61, Mass.

CONNECTORS—*Stand-off & Cone*

Ⓥ Citation Products Co., 233 E. 146th St., New York 51, N. Y.
Ⓥ Electrical Industries, Inc., 44 Glenmore Ave., Newark 4, N. J.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Johnson Co., E. F., Waseca, Minn.
Ⓥ Locke Incorporated, P. O. Box 57, Baltimore 3, Md.
Ⓥ Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.
Ⓥ STUPAKOFF CERAMIC & MFG. CO., Latrobe, Pa. ADV. PG. 147.
Ⓥ Thor Ceramics, Inc., 225 Belleville Ave., Bloomfield, N. J.

CONTACTORS

Ⓥ Allen-Bradley Co., 136 W. Greenfield Ave., Milwaukee 4, Wis.
Applied Science Corp. of Princeton, The, P. O. Box 44, Princeton, N. J.
Ⓥ Automatic Switch Co., 391 Lakeside Ave., Orange, N. J.
Ⓥ Clark Controller Co., The, 1146 E. 152nd St., Cleveland 10, Ohio.
Ⓥ Hallett Mfg. Co., 1601 Florence Ave., Inglewood, Calif.
Ⓥ Johnson Co., E. F., Waseca, Minn.
Ⓥ McQuay-Norris Mfg. Co., 2320 Marconi Ave., St. Louis 10, Mo.
Ⓥ MAKEPEACE CO., D. E., Attleboro, Mass. ADV. PG. 97.
Ⓥ Minneapolis-Honeywell Regulator Co., 2753 Fourth Avenue, S., Minneapolis, Minn.
Ⓥ R. B. M. Div., Essex Wire Corp., Logansport, Ind.
Ⓥ WARD LEONARD ELECTRIC CO., 31 South St., Mt. Vernon, N. Y. ADV. PG. 51, 52.
Weltronic Co., 19500 West Eight Mile Rd., Detroit 19, Mich.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Zenith Electric Co., 152 W. Walton St., Chicago 10, Ill.

CONTACTS, ELECTRICAL

Ⓥ BRAININ CO., C. S., 320 Washington St., Mt. Vernon, N. Y. ADV. PG. 246.
Ⓥ CENTRALAB DIV. OF GLOBE-UNION INC., 900 E. Keefe Ave., Milwaukee, Wis. ADV. PG. 64, 65.
Ⓥ Citation Products Co., 233 E. 146th St., New York 51, N. Y.
Ⓥ Cleveland Tungsten, Inc., 10200 Meech Ave., Cleveland, Ohio.
Ⓥ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles, 15, Calif.
Ⓥ Fansteel Metallurgical Corp., 2200 Sheridan Rd., North Chicago, Ill.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ GENERAL PLATE DIVISION, Metals & Controls Corp., Attleboro, Mass. ADV. PG. 245.
Ⓥ Gibson Electric Co., 8361 Frankstown Ave., Pittsburgh 21, Pa.
Ⓥ GRAPHITE METALLIZING CORP., 1041 Nepperhan Ave., Yonkers 3, N. Y. ADV. PG. 76.
Ⓥ KEYSTONE CARBON CO., INC., St. Marys, Pa. ADV. PG. 82.
Ⓥ MAKEPEACE CO., D. E., Attleboro, Mass. ADV. PG. 97.
Ⓥ MALCO TOOL & MFG. CO., 4025 W. Lake St., Chicago 24, Ill. ADV. PG. 234.
Ⓥ Mallory & Co., Inc., P. R., 3029 E. Washington St., Indianapolis 6, Ind.
Milford Rivet & Machine Co., Milford, Conn.
Ⓥ NEY CO., J. M., 179 Elm St., Hartford, Conn. ADV. PG. 132.
Ⓥ St. Mary's Carbon Co., State Rd., St. Marys, Pa.
Ⓥ Wilson Co., H. A., The, 105 Chestnut St., Newark 5, N. J.

CONTAINERS—*One Piece Drawn*

Ⓥ ELECTRO-SEAL CORP., 946 Lee St., DesPlaines, Ill. ADV. PG. 90.

CONTROLS—*Alarm System*

Ⓥ Adams & Westlake Co., Michigan St., Elkhart, Ind.
Ⓥ Antarctron, Inc., P. O. Box 151, Caldwell, N. J.
American Communications Corp., 306 Broadway, New York 7, N. Y.
Ⓥ Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.
Ⓥ Bendix Aviation Corp., Pacific Division, 11600 Sherman Way, N., Hollywood, Calif.
Ⓥ EDISON, INC., THOMAS A., Instrument Div., West Orange, N. J. ADV. PG. 129.
Ⓥ ELTRONICS, INC., 2649 No. Howard St., Philadelphia 33, Pa. ADV. PG. 238.
Ⓥ Fischer & Porter Co., Hatboro, Pa.
Ⓥ Gates Radio Co., Quincy, Ill.
Ⓥ Hastings Instrument Co., Box 1275, Hampton, Va.
Hole McCann Telephone Co., Inc., 25th St. & 3rd Ave., Brooklyn 32, N. Y.
Ⓥ Industrial Electronics Co., Inc., Hanover, Mass.
Ⓥ Lumenite Electric Co., 407 S. Dearborn St., Chicago, Ill.
Mack Electrical Devices, Inc., 44 Glenside Ave., Wyncote, Pa.
Ⓥ Magnetic Instrument Co., 82 W. Main St., West Orange, N. J.
Mercoid Corp., 4201 Belmont Ave., Chicago 41, Ill.
Ⓥ Photomatch, Inc., 77 Broadway, Cambridge 42, Mass.
Ⓥ Radiation Counter Laboratories, Inc., 1544 W. 21st St., Chicago 8, Ill.
Ⓥ RUSSELL & STOLL CO., INC., 125 Barclay St., New York 7, N. Y. ADV. PG. 231.
Ⓥ SERVO-TEK PRODUCTS CO., 4 Godwin Ave., Paterson 1, N. J. ADV. PG. 187.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ Vapor Recovery Systems Co., 2820 N. Alameda, Compton, Calif.
Ⓥ Warner Electronic Devices, Rankin, Ill.
Z & W Machine Products Inc., Electronics Div., 5151 St. Clair Ave., Cleveland 3, Ohio.

CONTROLS—*Auto Radio Remote*

Ⓥ Bendix Aviation Corp., Pacific Division, 11600 Sherman Way, N., Hollywood, Calif.
Ⓥ Cronamie, Inc., 3701 Ravenswood Ave., Chicago, Ill.
Ⓥ J F D MFG. CO., 6101-23 Sixteenth Ave., Brooklyn, N. Y. ADV. PG. 254, 264.
Ⓥ Lear, Inc., 110 Ionia Ave., NW., Grand Rapids 2, Mich.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ White Dental Mfg. Co., S. S., Industrial Div., 10 E. 40th St., New York, N. Y.

CONTROLS—*Automatic Tuning*

Ⓥ Air Associates, Inc., Teterboro, N. J.
Arlington Electric Products, Inc., 500 W. 52nd St., New York 19, N. Y.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ Collins Radio Co., Cedar Rapids, Iowa.
Elm Laboratories, 18 South Broadway, Dobbs Ferry, N. Y.
Ⓥ Lear, Inc., 110 Ionia Ave., NW., Grand Rapids 2, Mich.
Ⓥ North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.

CONTROLS—*Chemical*

Ⓥ Fischer & Porter Co., Hatboro, Pa.
Ⓥ General Controls Co., Glendale, Calif.
GENERAL ELECTRIC CO., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Industrial Instruments Inc., 17 Pollack Ave., Jersey City 5, N. J.
Ⓥ Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
Ⓥ Niagara Electron Laboratories, Andover, N. Y.
Ⓥ Robinette Co., W. C., 802 Fair Oaks Ave., South Pasadena, Calif.
Ⓥ SERVO-TEK PRODUCTS CO., 4 Godwin Ave., Paterson 1, N. J. ADV. PG. 187.

CONTROLS—*Counting & Sorting*

Ⓥ Automtron, Inc., P. O. Box 151, Caldwell, N. J.
Arlington Electric Products Inc., 500 W. 52nd St., New York 19, N. Y.
Ⓥ ARMA CORP., 254 36th St., Brooklyn 32, N. Y. ADV. PG. 146.
Ⓥ ATOMIC INSTRUMENT CO., 160 Charles St., Boston, Mass. ADV. PG. 218.
Ⓥ Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.
Ⓥ Berkeley Scientific Co., Richmond, Calif.
Ⓥ Dietz Co., S. J., Box 65, W. Englewood, N. J.
Ⓥ Eagle Signal Corp., Moline, Illinois.
Ⓥ Electrodyne Company, 32 Oliver St., Boston, Mass.
Ⓥ Electronic Associates Inc., Long Branch, N. J.
Ⓥ Electronic Control Corp., 1573 E. Forest St., Detroit, Mich.
Ⓥ ELTRONICS, INC., 2649 No. Howard St., Philadelphia 33, Pa. ADV. PG. 238.
Ⓥ Fielden Electronics, Inc., 1171 New York Ave., Huntington Station, N. Y.
Ⓥ Gorrell & Gorrell, Haworth, N. J.
Hetherington, Inc., Sharon Hill, Pa.
Ⓥ Industrial Electronics Co., Inc., Hanover, Mass.
Ⓥ INDUSTRIAL ELECTRONICS, INC., 2457 Woodward Ave., Detroit 1, Mich. ADV. PG. 255.
Magnetic Analysis Corp., 42-44 Twelfth St., Long Island City, N. Y.
Ⓥ North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
Ⓥ Photofact Company, 116 Nassau St., New York 7, N. Y.
Ⓥ POTTER INSTRUMENT CO., INC., 115 Cutter Mill Rd., Great Neck, N. Y. ADV. PG. 204.
Ripley Co., Inc., P. O. Box 31, Middletown, Conn.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ Standard Electronics Research Corp., 2 East End Ave., New York 21, N. Y.
Ⓥ Veeder Root Inc., Hartford 2, Conn.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Ⓥ Warner Electronic Devices, Rankin, Ill.
Z & W Machine Products Inc., Electronics Div., 5151 St. Clair Ave., Cleveland 3, Ohio.

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

CONTROLS—*Density*

See Controls, Specific Gravity

CONTROLS—*Dimension*

Arlington Electric Products Inc., 500 W. 52nd St., New York 19, N. Y.
Ⓥ Coral Designs, Box 248 Forest Hills, N. Y.
Ⓥ Electronic Control Corp., 1573 E. Forest St., Detroit, Mich.
Ⓥ Fielden Electronics Inc., 1171 New York Ave., Huntington Station, N. Y.
Ⓥ Rubinette Co., W. C., 802 Fair Oaks Ave., South Pasadena, Calif.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ Standard Electronics Research Corp., 2 East End Ave., New York 21, N. Y.

CONTROLS—*Door*

Ⓥ Barber-Colman Co., Rockford, Ill.
Ⓥ Deitz Co., S. J., Box 65, W. Englewood, N. J.
Ⓥ Electronic Control Corp., 1573 E. Forest St., Detroit, Mich.
Ⓥ EL-TRONICS, INC., 2649 No. Howard St., Philadelphia 33, Pa. ADV. PG. 236.
Ⓥ Fielden Electronics Inc., 1171 New York Ave., Huntington Station, N. Y.
Jarvis Electronics Corp., 6058 W. Fullerton Ave., Chicago 39, Ill.
Ⓥ O'Connor & Co., John T., West Orange, N. J.
Ⓥ Photobell Company, 116 Nassau St., New York 7, N. Y.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Ⓥ Worner Electronic Devices, Rankin, Ill.

CONTROLS—*Electronic Motor*

Ⓥ Acme Telectronix Div. of NEA Service, Inc., West Third & Lakeside, Cleveland 13, Ohio.
Ⓥ Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.
Ⓥ Clark Controller Co., The, 1146 E. 152nd St., Cleveland 10, Ohio.
Ⓥ Cutler-Hammer, Inc., 411 N. 12th St., Milwaukee 1, Wis.
Electron Equipment Corp., 917 Meridian Ave., South Pasadena, Calif.
Ⓥ Federal Electric Products Co., 50 Paris St., Newark, N. J.
Ⓥ FLADER, INC., Frederic, North Tonawanda, N. Y. ADV. PG. 240.
Ⓥ Gale Dorothea Mechanisms, 37-61 85th St., Jackson Heights, L. I., N. Y.
Ⓥ Gaveco Labs., Inc., 2 East End Ave., New York 21, N. Y.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schnectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Lyman Electronic Corp., 12 Cass St., Springfield, Mass.
Ⓥ Magnetic Instrument Co., 82 W. Main St., West Orange, N. J.
Ⓥ Mosher Electronic Controls, 130 W. 42nd St., New York, N. Y.
Ⓥ O'Connor & Co., John T., West Orange, N. J.
Ⓥ RAYTHEON MFG. CO., Power Tube Div., Waltham 54, Mass. ADV. PG. 257.
Ripley Co., Inc., P. O. Box 31, Middletown, Conn.
Ⓥ Robinette Co., W. C., 802 Fair Oaks Ave., S. Pasadena, Calif.
Ⓥ SERVO-TEK PRODUCTS CO., 4 Godwin Ave., Paterson, N. J. ADV. PG. 187.
Ⓥ Servomechanisms, Inc., 142 Mineola Blvd., Mineola, N. Y.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ Ther Electric & Machine Works, 15 S. Jefferson St., Chicago, Ill.
VECTRON INC., 235 High St., Waltham, Mass. ADV. PG. 266.
Weltronic Co., 19500 West 8 Mile Rd., Detroit 19, Mich.
Ⓥ WESTINGHOUSE ELEC. CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

CONTROLS—*Elevator Leveling*

Ⓥ Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schnectady 5, N. Y. ADV. PG. 5 to 18.
Lumenite Electric Co., 407 S. Dearborn St., Chicago, Ill.

CONTROLS—*Film Thickness*

Ⓥ Fielden Electronics Inc., 1171 New York Ave., Huntington Station, N. Y.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schnectady 5, N. Y. ADV. PG. 5 to 18.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ Standard Electronics Research Corp., 2 East End Ave., New York 21, N. Y.

CONTROLS—*Fluid Conductivity*

Ⓥ Foxboro Co., The, Foxboro, Mass.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schnectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Industrial Instruments Inc., 17 Pollack Ave., Jersey City 5, N. J.
Ⓥ Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
Lumenite Electric Co., 407 Dearborn St., Chicago, Ill.
Ⓥ Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Roberts Aves., Philadelphia 44, Pa.
Ⓥ Photoswitch, Inc., 77 Broadway, Cambridge 42, Mass.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Vokar Corp., 7300 Huron River Drive, Dexter, Mich.

CONTROLS—*Fluid Flow*

Ⓥ Air Associates, Inc., Teterboro, N. J.
Ⓥ Askania Regulator Co., 240 E. Ontario St., Chicago 11, Ill.
Ⓥ Bailey Meter Co., 1044 Ivanhoe Rd., Cleveland 10, Ohio.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ Caltron Co., 1406 So. Hobart Blvd., Los Angeles 6, Calif.
Ⓥ Fielden Electronics Inc., 1171 New York Ave., Huntington Station, N. Y.
Ⓥ Fischer & Porter Co., Hatboro, Pa.
Ⓥ Foxboro Co., The Foxboro, Mass.
Ⓥ General Controls Co., Glendale 1, Calif.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schnectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
Lumenite Electric Co., 407 S. Dearborn St., Chicago, Ill.
Ⓥ Micro Metallic Corp., 193 Bradford St., Brooklyn, N. Y.
Ⓥ Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Roberts Aves., Philadelphia 44, Pa.
Ⓥ SERVO-TEK PRODUCTS CO., 4 Godwin Ave., Paterson 1, N. J. ADV. PG. 187.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

CONTROLS—*Food Processing*

Ⓥ Askania Regulator Co., 240 E. Ontario St., Chicago 11, Ill.
Ⓥ Burling Instrument Co., 253 Springfield Ave., Newark 3, N. J.
Ⓥ Fischer & Porter Co., Hatboro, Pa.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schnectady 5, N. Y. ADV. PG. 5 to 18.
Lumenite Electric Co., 407 S. Dearborn St., Chicago, Ill.
Ⓥ Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Roberts Aves., Philadelphia 44, Pa.
Ⓥ Thompson & Associates, John E., 7210 S. Yates Ave., Chicago 49, Ill.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

CONTROLS—*Frequency*

Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ Burlington Instrument Co., Burlington, Iowa.
Ⓥ Collins Radio Co., Cedar Rapids, Iowa.
Ⓥ Cutler-Hammer, Inc., 411 N. 12th St., Milwaukee 1, Wis.
Ⓥ Electric Regulator Corp., 1938 Park Ave., New York 35, N. Y.
Ⓥ Gates Radio Co., Quincy, Ill.
Ⓥ Gaveco Labs., Inc., 2 East End Ave., New York 21, N. Y.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schnectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Magnetic Instrument Co., 82 W. Main St., West Orange, N. J.
Ⓥ Manufacturers Engr. & Equip. Corp., Willow Grove, Pa.
Meissner Mfg. Div., Maguire Industries, Inc., Mt. Carmel, Ill.
Monitor Products Co., 815 Fremont Ave., So. Pasadena, Calif.
Ⓥ NORRMAN LABORATORIES, Ernst Williams Bay, Wis. ADV. PG. 177.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Sierra Electronic Corp., San Carlos, Calif.
Ⓥ Varo Mfg. Co., Inc., Box 6318, Garland, Texas.

CONTROLS—*Gain*

See Attenuators

CONTROLS—*Heat Treating*

Ⓥ Askania Regulator Co., 240 E. Ontario St., Chicago 11, Ill.
Ⓥ Assembly Products, Inc., Chagrin Falls 6, Ohio.
Ⓥ Bristol Co., The, Waterbury 20, Conn.
Ⓥ Burling Instrument Co., 253 Springfield Ave., Newark 3, N. J.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schnectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Gordon Co., Claud S., 3000 S. Wallace St., Chicago 16, Ill.
Ⓥ Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
Ⓥ MACDONALD CO., INC., W. S., 33 University Rd., Cambridge 38, Mass. ADV. PG. 218.
Mack Electrical Devices, Inc., 43 Glenside Ave., Wyncote, Pa.
Ⓥ Meters, Inc., 915 Westfield Blvd., Indianapolis 20, Ind.
Ⓥ Minneapolis-Honeywell Regulator Co., 2753 Fourth Ave. S., Minneapolis, Minn.
Ⓥ Sherman Industrial Electronics Co., 505 Washington Ave., Belleville 9, N. J.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.
Ⓥ Wheelco Instruments Co., 847 W. Harrison St., Chicago 7, Ill.

CONTROLS—*Humidity*

American Instrument Co., 8030 Georgia Ave., Silver Spring, Md.
Ⓥ Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.
Ⓥ Barber-Colman Co., Rockford, Ill.
Ⓥ Bowser-Inc. Refrigeration Div., Terryville, Conn.
Ⓥ Bristol Co., The, Waterbury 20, Conn.
Ⓥ Fielden Electronics Inc., 1171 New York Ave., Huntington Station, N. Y.
Ⓥ Foxboro Co., The, Foxboro, Mass.
Ⓥ Friez Instrument Div., Bendix Aviation Corp., Baltimore 4, Md.
Ⓥ General Controls Co., Glendale 1, Calif.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schnectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
Mack Electrical Devices, Inc., 43 Glenside Ave., Wyncote, Pa.
Ⓥ Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Roberts Aves., Philadelphia 44, Pa.
Serdex, Inc., 91 Cambridge St., Boston, Mass.
Ⓥ United Electric Controls Co., 85 School St., Waterbury 72, Mass.
Vokar Corp., 7300 Huron River Drive, Dexter, Mich.
Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

CONTROLS—*Illumination*

Ⓥ Fisher-Pierce Co., Inc., 70 Ceylon St., Boston 21, Mass.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schnectady 5, N. Y. ADV. PG. 5 to 18.
Lumenite Electric Co., 407 S. Dearborn St., Chicago, Ill.
Mack Electrical Devices, Inc., 43 Glenside Ave., Wyncote, Pa.
Ⓥ O'Connor & Co., John T., West Orange, N. J.
Ripley Co., Inc., P. O. Box 31, Middletown, Conn.
Ⓥ Robinette Co., W. C., 802 Fair Oaks Ave., S. Pasadena, Calif.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ SUPERIOR ELECTRIC CO., The, 83 Meadow St., Bristol, Conn. ADV. PG. 110, 111.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.
Ⓥ Worner Electronic Devices, Rankin, Ill.

CONTROLS—*Inspection*

Ⓥ AIRCRAFT ELECTRONICS ASSOCIATES INC., 1031 New Britain Ave., Hartford 10, Conn. ADV. PG. 214.
Ⓥ ARMA CORP., 254 36th St., Brooklyn 32, N. Y. ADV. PG. 146.
Ⓥ Garrett Corp., M. A., 724 W. Winnebago St., Milwaukee 5, Wis.
Ⓥ O'Connor & Co., John T., West Orange, N. J.
Ⓥ Photobell Company, 116 Nassau St., New York 7, N. Y.
Ⓥ Photoswitch, Inc., 77 Broadway, Cambridge 42, Mass.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ Standard Electronics Research Corp., 2 East End Ave., New York 21, N. Y.
Ⓥ Telectronics Laboratory, Inc., 352 Maple Ave., Westbury, L. I., N. Y.
Ⓥ Worner Electronic Devices, Rankin, Ill.

CONTROLS—*Liquid Level*

Ⓥ Air Associates, Inc., Teterboro, N. J.
Ⓥ Airlectron, Inc., P. O. Box 151, Caldwell, N. J.
Ⓥ Askania Regulator Co., 240 E. Ontario St., Chicago 11, Ill.

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

Ⓥ Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.
Ⓥ Bailey Meter Co., 1044 Ivanhoe Rd., Cleveland 10, Ohio.
Ⓥ Baldwin Locomotive Works, Philadelphia 42, Pa.
Ⓥ Barber-Colman Co., Rockford, Ill.
Ⓥ Bristol Co., The, Waterbury 20, Conn.
Ⓥ Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ Coral Designs, Box 248, Forest Hills, N. Y.
Ⓥ Cutler-Hammer, Inc., 411 No. 12th St., Milwaukee 1, Wis.
Ⓥ ECLIPSE PIONEER DIV., Bendix Aviation Corp., Teterboro, N. J. ADV. PG. 17th.
Engineering Lab., Inc., 602 E. 4th St., Tulsa 3, Okla.
Ⓥ Farden Electronics Inc., 1171 New York Ave., Huntington Station, N. Y.
Ⓥ Fischer & Porter Co., Hatboro, Pa.
Ⓥ Foxboro Co., The, Foxboro, Mass.
Ⓥ General Controls Co., Glendale 1, Calif.
Ⓥ GUARDIAN ELECTRIC MFG. CO., 1621 W. Walnut St., Chicago 12, Ill. ADV. PG. 31.
Ⓥ Hercules Electric & Mfg. Co., Inc., 2500 Atlantic Ave., Brooklyn 7, N. Y.
Ⓥ Industrial Electronics Co., Inc., Hanover, Mass.
Ⓥ Leeds & Stevens Instruments, Inc., 4445 N. E. Glisan St., Portland 13, Ore.
Lumenite Electric Co., 407 S. Dearborn St., Chicago, Ill.
Marquis Corp., The, 4201 Belmont Ave., Chicago 41, Ill.
Ⓥ Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Roberts Aves., Philadelphia 44, Pa.
Ⓥ Moeller Electronic Controls, 110 W. 42nd St., New York, N. Y.
Ⓥ Photoswitch, Inc., 77 Broadway, Cambridge 42, Mass.
Ⓥ Ripley Co., Inc., P. O. Box 31, Middletown, Conn.
Ⓥ Robinette Co., W. C., 802 Fair Oaks Ave., South Pasadena, Calif.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ United Electric Controls Co., 85 School St., Watertown 72, Mass.
Weir Corp., 7300 Huron River Drive, Dexter, Mich.
Ⓥ Warrick Co., Chas. F., 16251 Hamilton Ave., Detroit 3, Mich.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.
Ⓥ Wonder Electronic Devices, Rankin, Ill.

CONTROLS—*Loop Regulation*

Ⓥ Clark Controller Co., The, 1146 E. 152nd St., Cleveland 10, Ohio.
Ⓥ Cutler-Hammer, Inc., 411 N. 12th St., Milwaukee 1, Wis.
Ⓥ Fischer & Co., John T., West Orange, N. J.
Ⓥ Hydraulic Researches, Inc., George A., 240 Congress St., Boston 10, Mass.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

CONTROLS—*Machine Safety*

Ⓥ AIRCRAFT ELECTRONICS Associates Inc., 1031 New Britain Ave., Hartford 10, Conn. ADV. PG. 214.
Ⓥ Deltz Co., S. J., Box 65, W. Englewood, N. J.
Ⓥ Electronic Control Corp., 1573 E. Forest St., Detroit, Mich.
Ⓥ Farden Electronics Inc., 1171 New York Ave., Huntington Station, N. Y.
Ⓥ Gevalt Corp., M. A., 724 W. Winnebago St., Milwaukee 5, Wis.
Ⓥ Hoffman Engineering Corp., Anoka, Minn.
Ⓥ Industrial Electronics Co., Inc., Hanover, Mass.
Ⓥ Lumenite Electric Co., 407 S. Dearborn St., Chicago, Ill.
Ⓥ Machine O Matic, Inc., P. O. Box 238, Ashley, Ohio.
Ⓥ O'Connor & Co., John T., West Orange, N. J.
Ⓥ Photoswitch, Inc., 77 Broadway, Cambridge 42, Mass.
Ⓥ RUSSELL & STOLL CO., INC., 125 Barclay St., New York 7, N. Y. ADV. PG. 211.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Ⓥ Wonder Electronic Devices, Rankin, Ill.

CONTROLS—*Materials Thickness*

Ⓥ Electric Eye Equipment Co., 16 W. Fairchild St., Danville, Ill.
Ⓥ Farden Electronics Inc., 1171 New York Ave., Huntington Station, N. Y.
Ⓥ Gevalt Corp., M. A., 724 W. Winnebago St., Milwaukee 5, Wis.
Ⓥ O'Connor & Co., John T., West Orange, N. J.
Ⓥ Pratt & Whitney Div., Niles-Bement-Pond Co., West Hartford 1, Conn.
Ⓥ Schaevitz Engineering, Crescent Blvd., at Drexel Ave., Pennsauken Township, Camden 11, N. J.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ Standard Electronics Research Corp., 2 East End Ave., New York 21, N. Y.
Ⓥ Stevens Arnold Inc., 22 Elkins St., South Boston 27, Mass.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

CONTROLS—*Mechanical Switch*

Lumenite Electric Co., 407 S. Dearborn St., Chicago, Ill.
Ⓥ National Acme Co., 176 E. 131st St., Cleveland 8, Ohio.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

CONTROLS—*Moisture*

American Instrument Co., 8030 Georgia Ave., Silver Spring, Md.
Ⓥ Barber-Colman Co., Rockford, Ill.
Ⓥ Bowser Inc., Refrigeration Div., Terryville, Conn.
Ⓥ Farden Electronics Inc., 1171 New York Ave., Huntington Station, N. Y.
Mack Electrical Devices Inc., 43 Glenside Ave., Wyncote, Pa.
Ⓥ Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Roberts Aves., Philadelphia 44, Pa.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.

CONTROLS—*Oxygen*

Ⓥ Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
Ⓥ Minneapolis-Honeywell Regulator Co., 2753 Fourth Avenue, S., Minneapolis, Minn.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.

CONTROLS—*Ozone*

Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.

CONTROLS—*PH*

Ⓥ Bristol Co., The, Waterbury 20, Conn.
Ⓥ Central Scientific Co., 1700 Irving Park Rd., Chicago 13, Ill.
Ⓥ Foxboro Co., The, Foxboro, Mass.
Ⓥ LaMotte Chemical Products Co., Towson 4, Baltimore, Md.
Ⓥ Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
Ⓥ Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Roberts Aves., Philadelphia 44, Pa.
Ⓥ National Technical Laboratories, 820 Mission St., South Pasadena, Calif.
Photovolt Corp., 95 Madison Ave., New York 16, N. Y.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.

CONTROLS—*Package Wrapping*

Ⓥ Deltz Co., S. J., Box 65, W. Englewood, N. J.
Ⓥ Industrial Electronics Co., Inc., Hanover, Mass.
Ⓥ POTTER INSTRUMENT CO., INC., 115 Cutter Mill Rd., Great Neck, N. Y. ADV. PG. 204.
Ripley Co., Inc., P. O. Box 31, Middletown, Conn.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Z & W Machine Products Inc., Electronics Div., 5151 St. Clair Ave., Cleveland 3, Ohio.

CONTROLS—*Photoelectric*

Ⓥ Acme Telectronix Div. of NEA Service, Inc., West Third & Lakeside, Cleveland 13, Ohio.
Ⓥ Arlington, P. O. Box 151, Caldwell, N. J.
Ⓥ American Scientific Co., P. O. Box 1, Highbridge Station, New York, N. Y.
Ⓥ ATOMIC INSTRUMENT CO., 160 Charles St., Boston, Mass. ADV. PG. 218.
Ⓥ Autotrol Co., The, Danville, Ill.
Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ Cutler-Hammer, Inc., 411 N. 12th St., Milwaukee 1, Wis.
Ⓥ Deltz Co., S. J., Box 65, W. Englewood, N. J.
Ⓥ Electronic Control Corp., 1573 E. Forest St., Detroit, Mich.
Ⓥ Eric Instrument Co., 96 So. Washington Ave., Bergenfield, N. J.
Ⓥ Fisher-Pierce Co., Inc., 70 Tenean St., Boston 21, Mass.
Ⓥ FORD INSTRUMENT CO., INC., 31-10 Thomson Ave., L. I. City, N. Y. ADV. PG. 278.
Gevalt & Burrell, Haworth, N. J.
Ⓥ Hoffman Engineering Corp., Anoka, Minn.
Ⓥ Industrial Electronics Co., Inc., Hanover, Mass.
Ⓥ Electro-Max Inc., 15 S. First St., Geneva, Ill.
Lumenite Electric Co., 407 S. Dearborn St., Chicago, Ill.
Ⓥ McKinzy Mfg. Co., Littleton, Mass.
Ⓥ Machine O Matic, Inc., P. O. Box 238, Ashley, Ohio.
Ⓥ Minneapolis-Honeywell Regulator Co., 2753 Fourth Avenue, S., Minneapolis, Minn.
Ⓥ O'Connor & Co., John T., West Orange, N. J.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Photobell Company, 116 Nassau St., New York 7, N. Y.
Ⓥ Photoswitch, Inc., 77 Broadway, Cambridge 42, Mass.
Ⓥ POTTER INSTRUMENT CO., INC., 115 Cutter Mill Rd., Great Neck, N. Y. ADV. PG. 204.
Ripley Co., Inc., P. O. Box 31, Middletown, Conn.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ Skaneateles Mfg. Co., Inc., 122 Dickerson St., Syracuse 2, N. Y.
Smucker & Co., Inc., A. F., 202 Tillary St., Brooklyn 1, N. Y.
Ⓥ Standard Electronics Research Corp., 2 East End Ave., New York 21, N. Y.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.
Ⓥ Warner Electronic Devices, Rankin, Ill.
Z & W Machine Products Inc., Electronics Div., 5151 St. Clair Ave., Cleveland 3, Ohio.

CONTROLS—*Photographic Exposure*

Ⓥ Acme Telectronix Div. of NEA Service, Inc., West Third & Lakeside, Cleveland 13, Ohio.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Industrial Timer Corp., 115 Edison Pl., Newark 5, N. J.
Ⓥ Kerkra Laboratories, 30 E. 10th St., New York 3, N. Y.
Lumenite Electric Co., 407 S. Dearborn St., Chicago, Ill.
Ⓥ POTTER INSTRUMENT CO., INC., 115 Cutter Mill Rd., Great Neck, N. Y. ADV. PG. 204.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

CONTROLS—*Positioning*

Ⓥ Air Associates, Inc., Teterboro, N. J.
Ⓥ Arlington, Inc., P. O. Box 151, Caldwell, N. J.
American Electroengineering Co., 2112 S. LaBrea Ave., Los Angeles, Calif.
Ⓥ Askania Regulator Co., 240 E. Ontario St., Chicago 11, Ill.
Ⓥ Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.
Ⓥ Barber-Colman Co., Rockford, Ill.
Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ Collins Radio Co., Cedar Rapids, Iowa.
Ⓥ Cutler-Hammer, Inc., 411 N. 12th St., Milwaukee 1, Wis.
Ⓥ ECLIPSE PIONEER DIV., Bendix Aviation Corp., Teterboro, N. J. ADV. PG. 17th.
Farden Electronics Inc., 1171 New York Ave., Huntington Station, N. Y.
FLADER, INC., FREDERIC, North Tonawanda, N. Y. ADV. PG. 240.
Ⓥ FORD INSTRUMENT CO., INC., 31-10 Thomson Ave., L. I. City, N. Y. ADV. PG. 278.
Ⓥ Gevalt Corp., M. A., 724 W. Winnebago St., Milwaukee 5, Wis.
Ⓥ Industrial Electronics Co., Inc., Hanover, Mass.
Ⓥ Lear, Inc., 110 Ionia Ave., N. W., Grand Rapids 2, Mich.
Ⓥ Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
Ⓥ Minneapolis-Honeywell Regulator Co., 2753 Fourth Ave. S., Minneapolis, Minn.
Ⓥ O'Connor & Co., John T., West Orange, N. J.
Ⓥ Reeves Instrument Corp., 215 E. 91st St., New York, N. Y.
Ripley Co., Inc., P. O. Box 31, Ripley, Conn.
Ⓥ Robinette Co., W. C., 802 Fair Oaks Ave., South Pasadena, Calif.
Ⓥ Schaevitz Engineering, Crescent Blvd. at Drexel Ave., Pennsauken Township, Camden 11, N. J.
Ⓥ SERVO-TEK PRODUCTS CO., 4 Godwin Ave., Paterson, N. J. ADV. PG. 187.
Ⓥ Servomechanisms, Inc., 142 Mineola Blvd., Mineola, N. Y.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ Stevens Arnold Inc., 22 Elkins St., South Boston 27, Mass.
Ⓥ SUPERIOR ELECTRIC CO., 83 Meadow St., Bristol, Conn. ADV. PG. 110, 111.
Ⓥ Vare Mfg. Co., Inc., Box 458, Garland, Texas.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Ⓥ Warner Electronic Devices, Rankin, Ill.

CONTROLS—*Power Level*

Ⓥ CINEMA ENGINEERING CO., 1510 W. Verdugo Ave., Burbank, Calif. ADV. PG. 186.
Ⓥ Gates Radio Co., Quincy, Ill.

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

Ⓥ Machine-O-Matic Inc., P. O. Box 238, Ashley, Ohio.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ Tech Laboratories, Inc., Bergen & Edsall Blvds., Palisades Park, N. J.

CONTROLS—*Pressure*

Ⓥ Allen-Bradley Co., 136 Greenfield Ave., Milwaukee 4, Wis.
Ⓥ Askania Regulator Co., 240 E. Ontario St., Chicago 11, Ill.
Ⓥ Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.
Ⓥ Bailey Meter Co., 1044 Ivanhoe Rd., Cleveland 10, Ohio.
Ⓥ Baldwin Locomotive Works, Philadelphia 42, Pa.
Ⓥ Beaver, Inc., Refrigeration Div., Terryville, Conn.
Ⓥ Bristol Co., The, Waterbury 20, Conn.
Ⓥ Coral Designs, P. O. Box 248, Forest Hills, N. Y.
Ⓥ Cutler-Hammer, Inc., 411 No. 12th St., Milwaukee 1, Wis.
Ⓥ ECLIPSE-PIONEER DIV., Bendix Aviation Corp., Teterboro, N. J. ADV. PG. 176.
Ⓥ Fischer & Porter Co., Hatboro, Pa.
Ⓥ FLADER INC., FREDERIC, North Tonawanda, N. Y. ADV. PG. 240.
Ⓥ Foxboro Co., The, Foxboro, Mass.
Ⓥ General Controls Co., Glendale 1, Calif.
Ⓥ Gerrett Corp., M. A., 724 W. Winnebago St., Milwaukee 5, Wis.
Ⓥ Hastings Instrument Co., Box 1275, Hampton, Va.
Mercoid Corp., The, 4201 Belmont Ave., Chicago 41, Ill.
Ⓥ Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Roberts Aves., Philadelphia 44, Pa.
Process & Instruments, 60 Greenpoint Ave., Brooklyn 22, N. Y.
Ⓥ Robinette Co., W. C., 802 Fair Oaks Ave., South Pasadena, Calif.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ United Electric Controls Co., 85 School St., Watertown 72, Mass.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

CONTROLS—*Printing*

Ⓥ Airtronics, Inc., P. O. Box 151, Caldwell, N. J.
Ⓥ Askania Regulator Co., 240 E. Ontario St., Chicago 11, Ill.
Ⓥ Bailey Meter Co., 1044 Ivanhoe Rd., Cleveland 10, Ohio.
Ⓥ Bristol Co., The, Waterbury 20, Conn.
Ⓥ Dietz Co., S. J., Box 65, W. Englewood, N. J.
Ⓥ Electric Eye Equipment Co., 16 W. Fairchild St., Danville, Ill.
Ⓥ FORD INSTRUMENT CO., INC., 31-10 Thomson Ave., L. I. City, N. Y. ADV. PG. 278.
Ⓥ Machine-O-Matic Inc., P. O. Box 238, Ashley, Ohio.
Ⓥ Robinette Co., W. C., 802 Fair Oaks Ave., South Pasadena, Calif.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

CONTROLS—*Radio Remote*

Ⓥ Aeronautical Radio Mfg. Co., 155 First St., Mineola, N. Y.
Ⓥ Air Associates, Inc., Teterboro, N. J.
American Electroengineering Div., 2132 S. Labrea Ave., Los Angeles, Calif.
Ⓥ Applied Science Corp. of Princeton, The, P. O. Box 34, Princeton, N. J.
Arlington Electric Products Inc., 500 W. 52nd St., New York 19, N. Y.
Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ Bendix Aviation Corp., Pacific Division, 11600 Sherman Way, North Hollywood, Calif.
Ⓥ Breisc Electronics Corp., 55 Vandam St., New York 13, N. Y.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ Collins Radio Co., Cedar Rapids, Iowa.
Ⓥ Communication Co., Inc., 300 Greco Ave., Coral Gables 34, Fla.
Ⓥ Doolittle Radio, Inc., 7421 S. Loomis Blvd., Chicago 36, Ill.
Ⓥ Dow Remote Control Co., Garden City, Mich.
Electro Engineering & Mfg. Co., 627 W. Alexandrine, Detroit, Mich.
Ⓥ Federal Mfg. Co., 218 Prospect Ave., Binghamton, N. Y.
Fire Laboratories, 18 South Broadway, Dobbs Ferry, N. Y.
Ⓥ Interstate Corp., 2701 California Ave., Seattle 6, Wash.
Ⓥ Kingston Mfg. Co., 358 State St., Binghamton, N. Y.
Ⓥ Lear, Inc., 110 Ionia Ave., N. W., Grand Rapids 2, Mich.
Ⓥ Lenkurt Electric Co., Inc., San Carlos, Calif.
Ⓥ Link Radio Corp., 125 W. 17th St., New York 11, N. Y.
Lumenite Electric Co., 407 S. Dearborn St., Chicago, Ill.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Precision Electronic Components Reyd., P. O. Box 264, Granby, Quebec, Canada.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 75. Inside Back and Back Covers.
Ⓥ REEVES-HOFFMAN CORP., 321 Cherry St., Carlisle, Pa. ADV. PG. 32.
Ⓥ Reeves Instrument Corp., 215 E. 91st St., New York, N. Y.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Smuckler & Co., Inc., A. F., 202 Tillary St., Brooklyn 1, N. Y.
Ⓥ Technical Materiel Corp., The, 453 W. 47th St., New York 19, N. Y.
Ⓥ Teletronics Laboratory, Inc., 552 Maple Ave., Westbury, L. I., N. Y.
Ⓥ Varo Mfg. Co., Inc., Box 638, Garland, Texas.
Ⓥ White Dental Mfg. Co., S. S., Industrial Div., 10 E. 40th St., New York, N. Y.
Ⓥ Wilcox Electric Co., 1400 Chestnut St., Kansas City, Mo.

CONTROLS—*Refrigeration Defrosting*

Ⓥ Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.
Ⓥ Cutler-Hammer, Inc., 411 No. 12th St., Milwaukee 1, Wis.
Ⓥ General Controls Co., Glendale 1, Calif.
Ⓥ HAYDON MFG. CO., INC., 584 E. Elm St., Torrington, Conn. ADV. PG. 102, 103.
Lumenite Electric Co., 407 S. Dearborn St., Chicago, Ill.
Ⓥ Paragon Electric Co., Two Rivers, Wisconsin.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

CONTROLS—*Register*

Ⓥ AIRCRAFT ELECTRONICS ASSOCIATES, INC., 1031 New Britain Ave., Hartford 10, Conn. ADV. PG. 214.
Ⓥ Airtronics, Inc., P. O. Box 151, Caldwell, N. J.
Ⓥ Askania Regulator Co., 240 E. Ontario St., Chicago 11, Ill.
Ⓥ Dietz Co., S. J., Box 65, W. Englewood, N. J.
Ⓥ Electric Eye Equipment Co., 16 W. Fairchild St., Danville, Ill.
Fisher-Pierce Co., 70 Ceylon St., Boston 21, Mass.
Ⓥ FORD INSTRUMENT CO., INC., 31-10 Thomson Ave., L. I. City, N. Y. ADV. PG. 278.
Ⓥ Industrial Electronics Co., Inc., Hanover, Mass.
Ⓥ Machine-O-Matic Inc., P. O. Box 238, Ashley, Ohio.
Ⓥ O'Connor & Co., John T., West Orange, N. J.
Ⓥ Photoswitch, Inc., 77 Broadway, Cambridge 42, Mass.
Ripley Co., Inc., P. O. Box 31, Middletown, Conn.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Ⓥ Worner Electronic Devices, Rankin, Ill.

CONTROLS—*Register Cutter*

Ⓥ Airtronics, Inc., P. O. Box 151, Caldwell, N. J.
Ⓥ Dietz Co., S. J., Box 65, W. Englewood, N. J.
Ⓥ FORD INSTRUMENT CO., INC., 31-10 Thomson Ave., L. I. City, N. Y. ADV. PG. 278.
Ⓥ Industrial Electronics Co., Inc., Hanover, Mass.
Ⓥ Machine-O-Matic, Inc., P. O. Box 238, Ashley, Ohio.
Ⓥ O'Connor & Co., John T., West Orange, N. J.
Ripley Co., Inc., P. O. Box 31, Middletown, Conn.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Ⓥ Worner Electronic Devices, Rankin, Ill.

CONTROLS—*Servo*

Ⓥ Air Associates, Inc., Teterboro, N. J.
Arlington Electric Products Inc., 500 W. 52nd St., New York 19, N. Y.
Ⓥ ARMA CORP., 254 36th St., Brooklyn, 32, N. Y. ADV. PG. 146.
Ⓥ Askania Regulator Co., 240 E. Ontario St., Chicago 11, Ill.
Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ Bendix Aviation Corp., Pacific Division, 11600 Sherman Way, N. Hollywood, Calif.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ CLAROSTAT MFG. CO., INC., Dover, N. H. ADV. PG. 227.
Ⓥ Collins Radio Co., Cedar Rapids, Iowa.
Ⓥ ECLIPSE-PIONEER DIV. OF BENDIX AVIATION CORP., Teterboro, N. J. ADV. PG. 176.
Ⓥ Electronic Associates, Inc., Long Branch, N. J.
Ⓥ FLADER INC., FREDERIC, North Tonawanda, N. Y. Adv. PG. 240.
Ⓥ FORD INSTRUMENT CO., INC., 31-10 Thomson Ave., L. I. City, N. Y. ADV. PG. 278.
Ⓥ Gavels Laboratories, Inc., 2 East End Avenue, New York 21, N. Y.
Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 9 to 18.
Ⓥ Genisco Electronics Corp., 6068 W. Fullerton Ave., Chicago 39, Ill.
Ⓥ KROHN-HITE INSTRUMENT CO., 580 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 128.
Ⓥ Lear, Inc., 110 Ionia Ave., NW., Grand Rapids 2, Mich.
Ⓥ Magnetic Instrument Co., 82 W. Main St., West Orange, N. J.
Ⓥ Minneapolis-Honeywell Regulator Co., 2753 Fourth Avenue, S., Minneapolis, Minn.
Ⓥ Philbrick Researches, Inc., George A., 230 Congress St., Boston 10, Mass.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Reeves Instrument Corp., 215 E. 91st St., New York, N. Y.
Ⓥ Robinette Co., W. C., 802 Fair Oaks Ave., South Pasadena, Calif.
Ⓥ SERVO CORP. OF AMERICA, 2020 Jericho Turnpike, New Hyde Park, N. Y. ADV. PG. 269.
Ⓥ SERVO-TEK PRODUCTS CO., 4 Godwin Ave., Paterson, N. J. ADV. PG. 187.
Ⓥ Servomechanisms, Inc., 142 Mineola Blvd., Mineola, N. Y.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ Standard Electronics Research Corp., 2 East End Ave., New York 21, N. Y.
Ⓥ Ther Electric & Machine Works, 155 Jefferson St., Chicago, Ill.
Ⓥ Transmitter Equipment Co., Inc., 345 Hudson St., New York 14, N. Y.
VECTRON, INC., 235 High St., Waltham, Mass. ADV. PG. 266.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. 868, Pittsburgh 30, Pa. ADV. PG. 77.
Ⓥ Wilson & Co., G. C., 2 N. Passaic Ave., Chatham, N. J.

CONTROLS—*Skew*

Ⓥ Industrial Electronics Co., Inc., Hanover, Mass.
Ⓥ SERVO-TEK PRODUCTS CO., 4 Godwin Ave., Paterson, N. J. ADV. PG. 187.

CONTROLS—*Smoke & Combustion*

Ⓥ Bailey Meter Co., 1044 Ivanhoe Rd., Cleveland, Ohio.
Ⓥ Bristol Co., The, Waterbury 20, Conn.
Ⓥ Combustion Control Corp., 77 Broadway, Cambridge 42, Mass.
Ⓥ Combustion Research Laboratories, Inc., 104-18 Metropolitan Ave., Forest Hills, N. Y.
Ⓥ Dietz Co., S. J., Box 65, W. Englewood, N. J.
Ⓥ Electronic Control Corp., 1573 E. Forest St., Detroit, Mich.
Ⓥ Ess Instrument Co., 96 So. Washington Ave., Bergenfield, N. J.
Ⓥ Industrial Electronics Co., Inc., Hanover, Mass.
Ⓥ Lectro-Max Inc., 15 S. First St., Geneva, Ill.
Ⓥ Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
Lumenite Electric Co., 407 S. Dearborn St., Chicago, Ill.
Ⓥ Machine-O-Matic Inc., P. O. Box 238, Ashley, Ohio.
Ⓥ Minneapolis-Honeywell Regulator Co., 2753 Fourth Avenue S., Minneapolis, Minn.
Ⓥ O'Connor & Co., John T., West Orange, N. J.
Ⓥ Photoswitch, Inc., 77 Broadway, Cambridge 42, Mass.
Ripley Co., Inc., P. O. Box 31, Middletown, Conn.
Smuckler & Co., Inc., A. F., 202 Tillary St., Brooklyn 1, N. Y.
Ⓥ Wheelco Instruments Co., 847 Harrison St., Chicago 7, Ill.
Ⓥ Worner Electronic Devices, Rankin, Ill.

CONTROLS—*Sound System*

American Communications Corp., 306 Broadway, New York 7, N. Y.
Ⓥ Breisc Electronics Corp., 55 Vandam St., New York 13, N. Y.
Ⓥ CINEMA ENGINEERING CO., 1510 W. Verdugo Ave., Burbank, Calif. ADV. PG. 186.
Ⓥ CLAROSTAT MFG. CO., INC., Dover, N. H. ADV. PG. 227.
Ⓥ Dynes Co., 191 Central Ave., Newark 3, N. J.
Ⓥ Fairchild Recording Equipment Corp., 154th St. & 7th Avenue, Whitestone, N. Y.
Ⓥ Gale Dorothea Mechanisms, 37-61 85th St., Jackson Heights, L. I., N. Y.
Ⓥ Gates Radio Co., Quincy, Ill.
Hart & Co., Inc., Frederick, 839 Main Ave., Poughkeepsie, N. Y.
Hose-McCann Telephone Co., Inc., 25th St. & 3rd Ave., Brooklyn 32, N. Y.
Ⓥ Lear, Inc., 110 Ionia Ave., NW., Grand Rapids 2, Mich.
Ⓥ Operadio Mfg. Co., 145th & Indiana Sts., St. Charles, Ill.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 75. Inside Back and Back Covers.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Smuckler & Co., Inc., A. F., 202 Tillary St., Brooklyn 1, N. Y.
Ⓥ STACKPOLE CARBON CO., St. Marys, Pa. ADV. PG. 166, 167.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ Wirt Co., 5221 Greene St., Philadelphia 44, Pa.

Ⓥ Indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

CONTROLS—*Specific Gravity*

Ⓥ Askania Regulator Co., 240 E. Ontario St., Chicago 11, Ill.
Ⓥ Ess Instrument Co., 96 So. Washington Ave., Bergenfield, N. J.
Ⓥ Fischer & Porter Co., Hatboro, Pa.
Ⓥ Foxboro Co., The, Foxboro, Mass.
Ⓥ Lewis & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
Ⓥ Magnetic Instrument Co., 82 W. Main St., West Orange, N. J.
Ⓥ Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Roberts Aves., Philadelphia 44, Pa.

CONTROLS—*Strain*

Ⓥ Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.
Ⓥ Baldwin Locomotive Works, Philadelphia 42, Pa.
Ⓥ Foxboro Co., The, Foxboro, Mass.
Ⓥ Gerrett Corp., M. A., 724 W. Winnebago St., Milwaukee 4, Wis.
Ⓥ Minneapolis-Honeywell Regulator Co., 2753 Fourth Avenue S., Minneapolis, Minn.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.

CONTROLS—*Temperature*

See Also Pyrometers

Ⓥ Allen-Bradley Co., 136 W. Greenfield Ave., Milwaukee 4, Wisconsin.
American Instrument Co., 8030 Georgia Ave., Silver Spring, Md.
Ⓥ Askania Regulator Co., 240 E. Ontario St., Chicago 11, Ill.
Ⓥ Assembly Products, Inc., Chagrin Falls 6, Ohio.
Atlas Electric Products Co., P. O. Box 4591, Erie, Pa.
Ⓥ Automatic Signal Division, 108 Regent St., East Norwalk, Conn.
Ⓥ Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.
Ⓥ Bailey Meter Co., 1044 Ivanhoe Rd., Cleveland 10, Ohio.
Ⓥ Barber-Colman Co., Rockford, Ill.
Ⓥ Bowser, Inc., Refrigeration Div., Terryville, Conn.
Ⓥ Bristol Co., The, Waterbury 20, Conn.
Ⓥ Bulling Instrument Co., 251 Springfield Ave., Newark 3, N. J.
Ⓥ Central Scientific Co., 1700 Irving Park Rd., Chicago 13, Ill.
Ⓥ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ Cutler-Hammer, Inc., 411 S. 12th St., Milwaukee 1, Wis.
Ⓥ EDISON, INC., THOMAS A., Instrument Div., West Orange, N. J. ADV. PG. 129.
Ⓥ ELECTRIC SOLDERING IRON CO., W. Elm St., Deep River, Conn. ADV. PG. 108.
Ⓥ Electronic Control Corp., 1575 E. Forest St., Detroit, Mich.
Ⓥ Emerald Inc., 43A Pleasant St., Ashland, Mass.
Ⓥ Fischer & Porter Co., Hatboro, Pa.
Ⓥ Foxboro Co., The, Foxboro, Mass.
Ⓥ Gardner Speaker, Div., Robertshaw-Fulton Controls Co., Knoxville 4, Tenn.
Ⓥ Gaveo Labs., Inc., 7 East End Ave., New York 21, N. Y.
Ⓥ General Controls Co., Glendale 1, Calif.
Ⓥ Gordon Co., Lloyd S., 1000 S. Wallace St., Chicago 16, Ill.
Ⓥ Hart Mfg. Co., 110 Bartholomew Ave., Hartford 1, Conn.
Ⓥ Hycon Testing Labs., Inc., 432 N. Lasalle St., Chicago 10, Ill.
Ⓥ Lear, Inc., 110 Ionia Ave., N.W., Grand Rapids 2, Mich.
Ⓥ Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
Ⓥ MACDONALD & CO., INC., W. S., 84 University Rd., Cambridge 38, Mass. ADV. PG. 218.
Mack Electrical Devices, Inc., 48 Glenside Ave., Wyncote, Pa.
Ⓥ Manning, Maxwell & Moore, Inc., Stratford, Conn.
Marconi Corp., The, 4201 Belmont Ave., Chicago 41, Ill.
Ⓥ Meters, Inc., 915 Westfield Blvd., Indianapolis 20, Ind.
Ⓥ Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Roberts Aves., Philadelphia 44, Pa.
Minsler Products Co., 615 Fremont St., So. Pasadena, Calif.
Ⓥ Mucon Specialties Co., 1031-1037 W. Washington St., Bloomington, Ill.
Philadelphia Thermometer Co., 4401 N. Sixth St., Philadelphia, Pa.
Process & Instruments, 60 Greenpoint Ave., Brooklyn 22, N. Y.
Ⓥ SPENCER-KENNEDY LABS., INC., 186 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 216.
Ⓥ Spencer Thermostat Co., 34 Forest St., Attleboro, Mass.
Ⓥ Standard Electronics Research Corp., 2 East End Ave., New York 21, N. Y.
Ⓥ STEVENS MFG. CO., INC., Mansfield, Ohio. ADV. PG. 222.
Ⓥ Thwing-Albert Instrument Co., 5351 Pulaski Ave., Philadelphia 44, Pa.
Ⓥ Ulanet Co., George, 413 Market St., Newark 5, N. J.
Ⓥ United Electric Controls Co., 85 School St., Watertown 72, Mass.
Ⓥ Waage Electric Inc., 54 Park Place, New York 7, N. Y.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.
Ⓥ Wheelco Instruments Co., 847 W. Harrison St., Chicago 7, Ill.

CONTROLS—*Tautering*

Ⓥ Arlington, Inc., P. O. Box 151, Caldwell, N. J.
Ⓥ Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.
Ⓥ Conway & Co., John T., West Orange, N. J.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

CONTROLS—*Timing*

Ⓥ Adams & Westlake Co., Michigan St., Elkhart, Ind.
Ⓥ Airborne Electronics Co., Metropolitan Airport, Hangar No. 1, Van Nuys, Calif.
Ⓥ ATOMIC INSTRUMENT CO., 160 Charles St., Boston, Mass. ADV. PG. 218.
Ⓥ Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.
Ⓥ Berkeley Scientific Co., Richmond, Calif.
Ⓥ Bristol Co., The, Waterbury 20, Conn.
Ⓥ Cinch Design, Box 348, Forest Hills, N. Y.
Ⓥ CRAMER CO., INC., R. W., Box 19, Centerbrook, Conn. ADV. PG. 208.
Ⓥ Cutler-Hammer, Inc., 411 No. 12th St., Milwaukee 1, Wis.
Durakool, Inc., 1010 N. Main St., Elkhart, Ind.
Ⓥ Eagle Signal Corp., Moline, Illinois.
Ⓥ EDISON, INC., THOMAS A., Instrument Div., West Orange, N. J. ADV. PG. 129.
Ⓥ Fisher-Pierce Co., Inc., 70 Ceylon St., Boston 21, Mass.
Ⓥ Gale Dorothea Mechanisms, 37 61 85th St., Jackson Heights 1, L. I., N. Y.
Ⓥ General Controls Co., Glendale 1, Calif.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Gerrett Corp., M. A., 724 W. Winnebago St., Milwaukee 5, Wis.
Ⓥ Gunnell & Gorrell, Haworth, N. J.
Ⓥ HAYDON CO., A. W., The, 232 N. Elm St., Waterbury, Conn. ADV. PG. 214.
Ⓥ HAYDON MFG. CO., INC., 584 E. Elm St., Torrington, Conn. ADV. PG. 102, 103.
Ⓥ Industrial Electronics Co., Inc., Hanover, Mass.
Ⓥ Industrial Timer Co., 115 Edison Pl., Newark 4, N. J.
Ⓥ Lear, Inc., 110 Ionia Ave., N. W., Grand Rapids 2, Mich.
Ⓥ Lectro-Max Inc., 15 S. First St., Geneva, Ill.
Ⓥ Librascope Laboratories, 30 E. 10th St., New York 3, N. Y.
Lumenite Electric Co., 407 S. Dearborn St., Chicago, Ill.
Ⓥ Mallory & Co., Inc., P. R., 3029 E. Washington St., Indianapolis 6, Ind.
Ⓥ Paragon Electric Co., Two Rivers, Wisconsin.
Photocon Research Products, Broadway, Cambridge 42, Mass.
Ⓥ POTTER INSTRUMENT CO., INC., 115 Cutter Mill Rd., Great Neck, N. Y. ADV. PG. 204.
Ⓥ Pratt & Whitney Div., Niles-Bement-Pond Co., West Hartford 1, Conn.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ Standard Electric Time Co., 89 Logan St., Springfield, Mass.
Ⓥ TELECHRON, INC., Homer Ave., Ashland, Mass. ADV. PG. 197.
Ⓥ Tork Clock Co., Inc., 1 Grove St., Mt. Vernon, N. Y.
Ⓥ Varo Mfg. Co., Inc., Box 636, Garland, Texas.
Weltronic Co., 19500 West 8 Mile Rd., Detroit 19, Mich.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.
Ⓥ Wilson & Co., G. C., 2 N. Patrick Ave., Chatham, N. J.

CONTROLS—*Torque*

Ⓥ Air Associates, Inc., Teterboro, N. J.
Ⓥ Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.
Ⓥ Baldwin Locomotive Works, Philadelphia 42, Pa.
Ⓥ Lear, Inc., 110 Ionia Ave., N. W., Grand Rapids 2, Mich.
Ⓥ Machine-O-Matic, Inc., P. O. Box 238, Ashley, Ohio.
Ⓥ Robinette Co., W. C., 802 Fair Oaks Ave., South Pasadena, Calif.

CONTROLS—*Turbidity*

Ⓥ Electric Eye Equipment Co., 1n W. Fairchild St., Danville, Ill.
Photovolt Corp., 95 Madison Ave., New York 16, N. Y.
Ⓥ Thompson & Associates, John E., 7215 S. Yates Ave., Chicago 49, Ill.

CONTROLS—*Ultrasonic*

Ⓥ CLARK CRYSTAL CO., 2 Farm Rd., Marlboro, Mass. ADV. PG. 210.
Ⓥ Crystal Research Labs., Inc., 29 Allyn St., Hartford, Conn.
Ⓥ Massa Laboratories, 3868 Carnegie St., Cleveland, Ohio.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ Triplett & Barton, Inc., 811 N. Lake St., Burbank, Calif.
Ⓥ Vernitron Co., 7400 E. 12th St., Kansas City 8, Mo.

CONTROLS—*Vacuum*

Ⓥ Allen-Bradley Co., 136 W. Greenfield Ave., Milwaukee 4, Wis.
Ⓥ Bailey Meter Co., 1044 Ivanhoe Rd., Cleveland 10, Ohio.
Ⓥ Bowser, Inc., Refrigeration Div., Terryville, Conn.
Ⓥ Bristol Co., The, Waterbury 20, Conn.
Ⓥ Cutler-Hammer, Inc., 411 N. 12th St., Milwaukee 1, Wis.
Electronic Brazing Co., 146 Glenridge Ave., Montclair, N. J.
Ⓥ Foxboro Co., The, Foxboro, Mass.
Ⓥ Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville 4, Tenn.
Ⓥ Hastings Instrument Co., Box 1275, Hampton, Va.
Ⓥ Hilton Industries, San Carlos, Calif.
Ⓥ Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Roberts Aves., Philadelphia 44, Pa.
Ⓥ National Research Corp., 70 Memorial Drive, Cambridge 42, Mass.
Ⓥ Optical Film Engineering Co., 2125 Cherry St., Philadelphia 3, Pa.
Process & Instruments, 60 Greenpoint Ave., Brooklyn 20, N. Y.
Ⓥ Skinnetales Mfg. Co., Inc., 122 Dickerson St., Syracuse 2, N. Y.
Ⓥ United Electric Controls Co., 85 School St., Watertown 72, Mass.
Ⓥ Wallace & Tiernan Products, Inc., Belleville 9, N. J.
Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

CONTROLS—*Ventilating Control System*

Ⓥ Barber-Colman Co., Rockford, Ill.
Ⓥ General Controls Co., Glendale 1, Calif.
Ⓥ Hastings Instrument Co., Box 1275, Hampton, Va.
Ⓥ Lear, Inc., 110 Ionia Ave., NW., Grand Rapids 2, Mich.
Meteoid Corp., 4201 Belmont Ave., Chicago, Ill.
Ⓥ Minneapolis-Honeywell Regulator Co., 2753 Fourth Ave., Minneapolis, Minn.
Ⓥ Robinette Co., W. C., 802 Fair Oaks Ave., South Pasadena, Calif.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Ⓥ Worner Electronic Devices, Rankin, Ill.

CONTROLS—*Volume & Tone*

American Communications Corp., 306 Broadway, New York 7, N. Y.
Ⓥ CENTRALAB, DIV. of Globe Union Inc., 900 E. Keefe Ave., Milwaukee 1, Wis. ADV. PG. 64, 65.
Chicago Telephone Supply Corp., 1142 W. Beardsley Ave., Elkhart, Ind.
Ⓥ CLAROSTAT MFG. CO., INC., Dover, N. H. ADV. PG. 227.
Ⓥ Daven Co., 191 Central Ave., Newark 4, N. J.
Ⓥ Fairchild Recording Equipment Corp., 154th St. & 7th Avenue, Whitestone, N. Y.
Hartley Co., Ltd., H. A., 162 Hammersmith Rd., London W. 14, England.
Ⓥ INTERNATIONAL RESISTANCE CO., 401 N. Broad St., Philadelphia 8, Pa. ADV. PG. 89.
Ⓥ Livingston Electronic Corp., Livingston, N. J.
Ⓥ Mallory & Co., Inc., P. R., 3029 E. Washington St., Indianapolis 6, Ind.
Ⓥ OHMITE MFG. CO., 4835 W. Flournoy St., Chicago 44, Ill. ADV. PG. 89.
Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Precision Electronic Components Reg'd., P. O. Box 264, Granby, Quebec, Canada.
Ⓥ STACKPOLE CARBON CO., St. Marys, Pa. ADV. PG. 166, 167.
Ⓥ TRIMM, INC., 400 W. Lake St., Libertyville, Ill. ADV. PG. 266.
Ⓥ Vitro Corp., 5231 Greene St., Philadelphia 44, Pa.

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

CONTROLS—*Water Detector*

Ⓥ Fischer & Porter Co., Hatboro, Pa.
Lumenite Electric Co., 407 S. Dearborn St., Chicago, Ill.

CONTROLS—*Weight*

Ⓥ Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.
Ⓥ Foxboro Co., The, Foxboro, Mass.
Ⓥ Industrial Electronics Co., Inc., Hanover, Mass.
Ⓥ Intervox Corp., 2701 California Ave., Seattle 6, Wash.
Streeter-Amet Corp., 4101 N. Ravenswood Ave., Chicago 13, Ill.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

CONTROLS—*Welding*

Ⓥ Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.
Ⓥ Cutler-Hammer, Inc., 411 N. 12th St., Milwaukee 1, Wis.
Ⓥ Eisler Engineering Co., Inc., 740 S. 13th St., Newark 3, N. J.
Ⓥ Foster Transformer Co., Inc., 3820 Colerain Ave., Cincinnati 23, Ohio.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Industrial Electronics Co., Inc., Hanover, Mass.
Ⓥ Lectro Max Inc., 15 S. First St., Geneva, Ill.
Lumenite Electric Co., 407 S. Dearborn St., Chicago, Ill.
Ⓥ OHMITE MFG. CO., 4835 W. Flournoy St., Chicago 44, Ill. ADV. PG. 83.
Ripley Co., Inc., P. O. Box 31, Middletown, Conn.
Weltronix Co., 19500 West 8 Mile Rd., Detroit 19, Mich.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

CONVERTERS—*f-m*

Ⓥ Acme Telectronix Div. of NEA Service, Inc., West Third & Lakeside, Cleveland 13, Ohio.
Aeronautive Equipment Corp., 1632-B Central St., Kansas City 10, Mo.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ Ferris Instrument Co., 110 Cornelia St., Boonton, N. J.
Meissner Mfg. Div., Maguire Industries, Inc., Mt. Carmel, Ill.

CONVERTERS—*Frequency Shift*

Aeronautive Equipment Corp., 1632-B Central St., Kansas City 10, Mo.
Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ Boehme Inc., H. O., 915 Broadway, New York 10, N. Y.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ Collins Radio Co., Cedar Rapids, Iowa.
Elton, Inc., 407 N. Jackson St., Jackson, Mich.
Erco Radio Labs., Inc., East Stewart Ave., Garden City, N. Y.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Mattoy Mfg. Corp., Littleton, Mass.
Ⓥ NATIONAL CO., INC., 61 Sherman St., Malden 48, Mass. ADV. PG. 33 to 36.
Ⓥ NORTHERN RADIO CO., INC., 143-145 W. 22nd St., New York 11, N. Y. ADV. PG. 132, 133.
Ⓥ Press Wireless Mfg. Co., Inc., Cantiague Rd., Hicksville, L. I., N. Y.
Ⓥ RADIO FREQUENCY LABS., INC., Boonton 2, N. J. ADV. PG. 172.
Ⓥ Schuttig & Co., Inc., 9th & Kearney Sts. NE., Washington 17, D. C.
Ⓥ Technical Material Corp., The, 453 W. 47th St., New York 19, N. Y.
Ⓥ Varo Mfg. Co., Inc., Box 638, Garland, Texas.

CONVERTERS—*High Frequency*

Ⓥ Ajax Electrothermic Corp., Ajax Park, Trenton 5, N. J.
Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ CLARK CRYSTAL CO., 2 Farm Rd., Marlboro, Mass. ADV. PG. 210.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Gonset Co., 72 E. Tujunga Ave., Burbank, Calif.
Ⓥ Kato Engineering Co., 1415 First Ave., Mankato, Minn.
Ⓥ Lepel High Frequency Labs., Inc., 39 W. 60th St., New York 23, N. Y.
Ⓥ NATIONAL CO., INC., 61 Sherman St., Malden 48, Mass. ADV. PG. 33 to 36.
Ⓥ Sax Ridge Products Mfg. Div. of Video Television, Inc., 239 E. 127th St., New York 35, N. Y.
Radio Mfg. Engineering, Inc., 300-302 First Ave., Peoria 6, Ill.
Ⓥ Radio Transceiver Labs., 116-23 Jamaica Ave., Peoria 6, Ill.
Telemark, Inc., 100 Greyrock Pl., Stamford, Conn.
Ⓥ Varo Mfg. Co., Inc., Box 638, Garland, Texas.

CONVERTERS—*Low Frequency*

Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ Continental Electric Co., Inc., 334 Ferry St., Newark 5, N. J.
Ⓥ CORNELL-DUBILIER ELECTRIC CORP., South Plainfield, N. J. ADV. PG. 70.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Geophysical Instrument Co., 1820 N. Nash St., Arlington, Va.
Ⓥ Lepel High Frequency Labs., Inc., 39 W. 60th St., New York 23, N. Y.
Ⓥ Lorain Products Corp., 1122 F. St., Lorain, Ohio.
Ⓥ RADIO FREQUENCY LABS., INC., Boonton 2, N. J. ADV. PG. 172.
Ⓥ Varo Mfg. Co., Inc., Box 638, Garland, Texas.

CONVERTERS—*Rotary*

Ⓥ CARTER MOTOR CO., 2646 N. Maplewood Ave., Chicago 47, Ill. ADV. PG. 192.
Ⓥ Continental Electric Co., Inc., 334 Ferry St., Newark 5, N. J.
Ⓥ ECLIPSE-PIONEER DIV., Bendix Aviation Corp., Teterboro, N. J. ADV. PG. 176.
Ⓥ Elcor Inc., 1501 W. Congress St., Chicago 7, Ill.
Ⓥ Electric Specialty Co., 211 South St., Stamford, Conn.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Gothard Mfg. Co., 2110 Clear Lake Ave., Springfield, Ill.
Ⓥ Great Lakes Electric Mfg. Co., 17 S. Desplaines St., Chicago 6, Ill.
Ⓥ Janette Mfg. Co., 556 W. Monroe St., Chicago 6, Ill.
Ⓥ Kato Engineering Co., 1415 First Ave., Mankato, Minn.
Ⓥ Leland Electric Co., 1501 Webster St., Dayton 1, Ohio.
Ⓥ RED BANK DIVISION, Bendix Aviation Corp., Red Bank, N. J. ADV. PG. 61, 127.
Ⓥ Varo Mfg. Co., Inc., Box 638, Garland, Texas.

CONVERTERS, STATIC

Ⓥ Varo Mfg. Co., Inc., Box 638, Garland, Texas.

CONVERTERS—*Vibrator Type*

Ⓥ AIRPAX PRODUCTS CO., 1024 Greenmount Ave., Baltimore 2, Md. ADV. PG. 275.
Ⓥ AMERICAN TELEVISION & RADIO CO., 300 E. Fourth St., St. Paul 1, Minn. ADV. PG. 275.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ CORNELL-DUBILIER ELECTRIC CORP., South Plainfield, N. J. ADV. PG. 70.
Ⓥ ELECTRONIC MEASUREMENTS CO., Red Bank, N. J. ADV. PG. 139.
Ⓥ James Vibrapower Co., 3224 Armitage Ave., Chicago 47, Ill.
Ⓥ KURMAN ELECTRIC CO., INC., 35-18 37th St., Long Island City 1, N. Y. ADV. PG. 214.
Ⓥ Minneapolis Honeywell Regulator Co., Industrial Div., Wayne & Roberts Aves., Philadelphia 44, Pa.
Ⓥ Pelco Corp., Tioga & C Sts., Philadelphia 44, Pa.
Ⓥ Radiart Corp., The, 3571 W. 62nd St., Cleveland 2, Ohio.
Ⓥ Servomechanisms, Inc., 142 Mineola Blvd., Mineola, N. Y.
Ⓥ Stancil-Hoffman Corp., 1016 N. Highland Ave., Hollywood 38, Calif.
Ⓥ Stevens-Arnold Inc., 22 Elkins St., South Boston 27, Mass.
Ⓥ Varo Mfg. Co., Inc., Box 638, Garland, Texas.
Vokar Corp., 7309 Huron River Drive, Dexter, Mich.

COOKERS—*Electronic*

Ⓥ Electronic Engineering Corp., 624 Ridge Rd., Lyndhurst, N. J.
Ⓥ RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
Ⓥ Sherman Industrial Electronics Co., Inc., 506 Washington Ave., Belleville 9, N. J.

CORD SETS

Ⓥ AEROLITE ELECTRONIC HARDWARE CORP., 507 26th St., Union City, N. J. ADV. PG. 138.
Ⓥ ALDEN PRODUCTS CO., 117 No. Main St., Brockton 64, Mass. ADV. PG. 235.
Ⓥ Alpha Wire Corp., 50 Howard St., New York, N. Y.
Ⓥ American Electric Cable Co., 181 Appleton St., Holyoke, Mass.
Ⓥ AVIOMETER DIV. of Roanwell Corp., 602 Pacific St., Brooklyn 17, N. Y. ADV. PG. 66.
Birnbach Radio Co., Inc., 145 Hudson St., New York, N. Y.
Ⓥ Citation Products Co., 233 E. 146th St., New York 51, N. Y.
Ⓥ Columbia Wire & Supply Co., 2850 Irving Park Rd., Chicago 18, Ill.
Ⓥ CORNISH WIRE CO., 15 Park Row, New York 7, N. Y. ADV. PG. 140.
Ⓥ Diamond Wire & Cable Co., Sycamore, Ill.
Ⓥ Essex Wire Corp., 1601 Wall St., Fort Wayne 6, Ind.
Ⓥ Etraco Mfg. Co., Inc., Woods Church Rd., Flemington, N. J.
Ⓥ Franklin Mfg. Corp., A. W., 43-20 34th St., Long Island City 1, N. Y.
Ⓥ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
Ⓥ GENERAL ELECTRIC CO., Construction Material's Dept., 1285 Boston Ave., Bridgeport 2, Conn. ADV. PG. 5 to 18.
Ⓥ Haft & Sons Inc., 79 Third St., Brooklyn 31, N. Y.
Ⓥ Industrial Electrical Works, 1509 Chicago St., Omaha 2, Nebraska.
Ⓥ Kellogg Switchboard & Supply Co., 6650 S. Cicero Ave., Chicago 38, Ill.
Ⓥ Kailed Kords, Inc., New Haven, Conn.
Ⓥ Kulka Electric Mfg. Co., Inc., 30 South St., Mt. Vernon, N. Y.
Ⓥ LENZ ELECTRIC MFG. CO., 1751 North Western Ave., Chicago 47, Ill. ADV. PG. 122.
Ⓥ Molded Insulation Co., Aircraft Control Div., 335 E. Price St., Philadelphia, Pa.
Ⓥ Pacific Electricord Company, P. O. Box 1260, Beverly Hills, Calif.
Ⓥ PHALO PLASTICS CORP., 25 Foster St., Worcester 8, Mass. ADV. PG. 212.
Ⓥ Plastic Wire & Cable Corp., Jewett City, Conn.
Ⓥ Plastoid Corp., 10 Mill Rd., Hamburg, N. J.
Ⓥ Rupp's Assembling & Mfg. Works, 2341 N. Seminary Ave., Chicago 14, Ill.
Selectar Industries, Inc., 401 E. 138th St., New York 54, N. Y.
Ⓥ Sheldon Electric Co., Textile Cord St., Irvington, N. J.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Star Measurements Co., 442 E. 166th St., New York 56, N. Y.
Ⓥ U. S. Rubber Co., 1230 Avenue of the Americas, New York 20, N. Y.
Ⓥ Wile Electric Co., Niantic, Conn.

CORDS—*Dial Cords & Cables*

Ⓥ ALDEN PRODUCTS CO., 117 N. Main St., Brockton 64, Mass. ADV. PG. 235.
Ⓥ Alpha Wire Corp., 50 Howard St., New York, N. Y.
Birnbach Radio Co., Inc., 145 Hudson St., New York, N. Y.
Ⓥ Carol Cable Co., 190 Middle St., Pawtucket, R. I.
Ⓥ Citation Products Co., 233 E. 146th St., New York 51, N. Y.
Ⓥ Connecticut Telephone & Electric Div., Great American Industries, Inc., 70 Britannia St., Meriden, Conn.
Ⓥ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
Ⓥ J F D MFG. CO., 6101-23 Sixteenth Ave., Brooklyn, N. Y. ADV. PG. 254, 264.
Ⓥ Kellogg Switchboard & Supply Co., 6650 S. Cicero Ave., Chicago 38, Ill.
Ⓥ Primore Mfg. Co., 211 University Place, New York 3, N. Y.
Ⓥ Schott Co., Walter J., 9306 Santa Monica Blvd., Beverly Hills, Calif.
Ⓥ Smith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London W. C. 2, England.

CORDS—*Line*

Ⓥ ALDEN PRODUCTS CO., 117 No. Main St., Brockton 64, Mass. ADV. PG. 235.
Ⓥ Alpha Wire Corp., 50 Howard St., New York, N. Y.
Ⓥ American Electric Cable Co., 181 Appleton St., Holyoke, Mass.
Ⓥ Belden Mfg. Co., 4647 W. Van Buren St., Chicago 44, Ill.
Birnbach Radio Co., Inc., 145 Hudson St., New York, N. Y.
Ⓥ Carol Cable Co., 190 Middle St., Pawtucket, R. I.
Ⓥ Citation Products Co., 233 E. 146th St., New York 51, N. Y.
Ⓥ Columbia Wire & Supply Co., 2850 Irving Park Rd., Chicago 18, Ill.
Ⓥ CORNISH WIRE CO., 15 Park Row, New York 7, N. Y. ADV. PG. 140.
Ⓥ Diamond Wire & Cable Co., Sycamore, Ill.
Ⓥ Etraco Mfg. Co., Inc., Woods Church Rd., Flemington, N. J.
Ⓥ General Insulated Wire Works, Inc., 69 Gordon Ave., Providence 5, R. I.
Ⓥ J F D MFG. CO., 6101-23 Sixteenth Ave., Brooklyn, N. Y. ADV. PG. 254, 264.

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

Ⓥ Kulka Electric Mfg. Co., Inc., 30 South St., Mt. Vernon, N. Y.
Ⓥ Pacific Electricord Company, P. O. Box 1260, Beverly Hills, Calif.
Ⓥ PHALO PLASTICS CORP., 25 Foster St., Worcester 8, Mass. ADV. PG. 212.
Ⓥ Plastic Wire & Cable Corp., Jewett City, Conn.
Ⓥ Plastoid Corp., 10 Mill Rd., Hamburg, N. J.
Ⓥ ROME CABLE CORP., 330 Ridge St., Rome, N. Y. ADV. PG. 131.
Ⓥ Rupp's Assembling & Mfg. Works, 2341 N. Seminary Ave., Chicago 14. ADV. PG. 212.
Selectar Industries, Inc., 401 E. 138th St., New York 54, N. Y.
Ⓥ Wells Electric Co., New London, Conn.
Wood Electric Co., Inc., C. D., 70-17 83rd St., Glendale, L. I., N. Y.

CORDS—*Line Resistance*

Ⓥ American Electric Cable Co., 181 Appleton St., Holyoke, Mass.
Ⓥ Belden Mfg. Co., 4647 W. Van Buren St., Chicago 44, Ill.
Birnbach Radio Co., Inc., 145 Hudson St., New York, N. Y.
Ⓥ Columbia Wire & Supply Co., 2850 Irving Park Rd., Chicago 18, Ill.
Ⓥ J. F. D. MFG. CO., 4102-24 Sixteenth Ave., Brooklyn, N. Y. ADV. PG. 204, 364.
Ⓥ Primore Mfg. Co., 119 University Place, New York 3, N. Y.

CORDS—*Patch*

Ⓥ Audio Equipment Sales, 153 W. 33rd St., New York 1, N. Y.
Ⓥ Collins Radio Co., Cedar Rapids, Iowa.
Ⓥ Connecticut Telephone & Electric Div., Great American Industries, Inc., 70 Britannia St., Meriden, Conn.
Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Ⓥ Jings Electronics Co., Inc., 811 Lexington Ave., Brooklyn 21, N. Y.
Ⓥ LENZ ELECTRIC MFG. CO., 1751 North Western Ave., Chicago 47, Ill. ADV. PG. 123.
National Electrical Machine Shops, Inc., 919 Jesup-Morse Dr., Silver Spring, Md.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., Central Office, Camden, N. J. ADV. PG. 73 to 75. Inside Back and Back Covers.
Selectar Industries, Inc., 401 E. 138th St., New York 54, N. Y.

CORES—*Ceramic*

Ⓥ AMERICAN LAVA CORP., Chattanooga 5, Tenn. ADV. PG. 27.
Ⓥ CENTRALAB DIV. of Globe Union Inc., 900 E. Keefe Ave., Milwaukee, Wis. ADV. PG. 41 to 44.
Ⓥ GENERAL CERAMICS & STEATITE CORP., Keasbey, N. J. ADV. PG. 219.
Ⓥ Hinchberger & Co., Inc., M., 2425 37th St., Brooklyn 18, N. Y.
Ⓥ Lavoie Corp., 37 S. 6th St., Newark 7, N. J.
Ⓥ Lenkurt Mfg. Co., Kraft Liverpool, Calif.
Ⓥ North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
Ⓥ STACKPOLE CARBON CO., St. Marys Pa. ADV. PG. 166, 167.
Ⓥ STUPAKOFF CERAMIC & MFG. CO., Latrobe, Pa. ADV. PG. 147.
Ⓥ Thor Ceramics, Inc., 225 Belleville Ave., Bloomfield, N. J.
Ⓥ Wisconsin Porcelain Co., Sun Prairie, Wis.

CORES—*High Permeability Magnetic*

Ⓥ Arnold Engineering Co., 147 E. Ontario St., Chicago 11, Ill.
Ⓥ GENERAL CERAMICS & STEATITE CORP., Keasbey, N. J. ADV. PG. 219.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ MAGNETIC CORE CORP., 142-144 S. Highland Ave., Ossining, N. Y. ADV. PG. 272.
Magnetics, Inc., P. O. Box 391, Butler, Pa.
Ⓥ North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
Ⓥ Pyroferric Co., 621 E. 216th St., New York 67, N. Y.
Ⓥ Quality Components, Inc., St. Marys, Pa.
Ⓥ Radon Electric Co., 52 E. 19th St., New York 3, N. Y.
Ⓥ RADIO CORES, INC., 9540 Tully Ave., Oak Lawn, Ill. ADV. PG. 260.
Ⓥ Speer Resistor Corp., St. Marys, Pa.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.

CORES—*Powdered Iron*

Ⓥ Ampex Division, Chrysler Corp., Detroit, 11, Mich.
Ⓥ Browning & Co., Inc., Henry L., 1 Central Ave., West Orange, N. J.
Ⓥ Delco Radio Div., General Motors Corp., Kokomo, Ind.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ International Powder Metallurgy Co., 439 W. Main St., Ridgway, Pa.
Ⓥ Lavoie Corp., 37 S. 6th St., Newark 7, N. J.
Ⓥ Lenkurt Electric Co., Inc., San Carlos, Calif.
Ⓥ MAGNETIC CORE CORP., 142-144 South Highland Ave., Ossining, N. Y. ADV. PG. 272.
Ⓥ Powdered Metal Products Corp., Franklin Park, Ill.
Ⓥ Pyroferric Co., 621 E. 216th Street, New York 67, N. Y.
Ⓥ Quality Components, Inc., St. Marys, Pa.
Ⓥ RADIO CORES, INC., 9540 Tully Ave., Oak Lawn, Ill. ADV. PG. 260.
Ⓥ Speer Resistor Corp., St. Marys, Pa.
Ⓥ STACKPOLE CARBON CO., St. Marys, Pa. ADV. PG. 166, 167.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.

CORES—*Slug Tuning Units*

Ⓥ Crowley & Co., Inc., Henry L., 1 Central Ave., West Orange, N. J.
Ⓥ GENERAL CERAMICS & STEATITE CORP., Keasbey, N. J. ADV. PG. 219.
Ⓥ Lavoie Corp., 37 S. 6th St., Newark 7, N. J.
Ⓥ Lenkurt Electric Co., Inc., San Carlos, Calif.
Monroe Cal Co., 2049 N. Narragansett Ave., Chicago 34, Ill.
Ⓥ Pyroferric Co., 621 E. 216th St., New York 67, N. Y.
Ⓥ Radio Condenser Co., Camden, N. J.
Ⓥ RADIO CORES, INC., 9540 Tully Ave., Oak Lawn, Ill. ADV. PG. 260.
Ⓥ Speer Resistor Corp., St. Marys, Pa.

CORTICAL STIMULATORS

Ⓥ Electro-Medical Lab., Inc., Hollister, Mass.
Ⓥ Grass Instrument Co., 101 Old Colony Ave., Quincy, Mass.
Physics & Instruments, 62 Greenpoint Ave., Brooklyn 22, N. Y.
Ⓥ Roanoke Inc., 27 W. 24th St., New York 10, N. Y.

COUNTERS, RADIATION

Ⓥ Amperex Electronic Corp., 25 Washington St., Brooklyn 1, N. Y.
Ⓥ ATOMIC INSTRUMENT CO., 160 Charles St., Boston, Mass. ADV. PG. 218.
Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ Berkeley Scientific Co., Richmond, Calif.
Ⓥ Chronetics Corp., 11427 S. W. Pico Blvd., Los Angeles 64, Calif.
Ⓥ Cyclotron Specialties Co., Moraga 8, Calif.
Ⓥ Electronic Products Co., 111 E. 3rd St., Mt. Vernon, N. Y.
Ⓥ ELTRONICS INC., 3649 N. Howard St., Philadelphia 33, Pa. ADV. PG. 238.
Ⓥ FLADER INC., Frederic, North Tonawanda, N. Y. ADV. PG. 240.
Ⓥ Harry Miller Co., 5235 Grand River, Detroit 8, Mich.
Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Harshaw Scientific Div. of the Harshaw Chemical Co., 1945 E. 97th St., Cleveland 6, Ohio.
Ⓥ Herb-Kaufer Mfg. Co., Instrument Div., 12 E. 41st St., Chicago 47.
Ⓥ MACDONALD CO., INC., W. S., 33 University Rd., Cambridge 38, Mass. ADV. PG. 218.
Ⓥ Manufacturers Engr. & Tool Corp., Willow Grove, Pa.
Ⓥ Nuclear Technical Laboratories, 820 Mission St., South Pasadena, Calif.
Ⓥ Victoreen Development Lab., P. O. Box 7235, Kansas City, Mo.
Ⓥ Victoreen Instrument & Chemical Corp., 2249 W. 96th St., Cleveland 2, Ohio.
Ⓥ Wisconsin Glass of America, The, 497 Union St., Rochester 11, N. Y.
Ⓥ Wonder Scientific Supply Co., 3401 N. 33rd St., Omaha, Nebr.
Ⓥ POTTER INSTRUMENT CO., INC., 115 Cutter Mill Rd., Great Neck, N. Y. ADV. PG. 264.
Ⓥ Radiation Counter Laboratories, Inc., 1844 W. 21st St., Chicago 8, Illinois.
Ⓥ Radioactive Products, Inc., 3201 E. Woodbridge St., Detroit 7, Mich.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ Special Instruments Laboratory, Inc., 1003 Highland Ave., Knoxville, Tenn.
Streeter-Amet Corp., 4101 N. Ravenswood Ave., Chicago 13, Ill.
Ⓥ Technical Associates, 3730 San Fernando Rd., Glendale 4, Calif.
Tracerlab Inc., 130 High St., Boston 10, Mass.
Ⓥ VICTOREEN INSTRUMENT CO., 5806 Hough Ave., Cleveland 3, Ohio. ADV. PG. 241.
Ⓥ Wood Laboratory, N. 5646 Harper Ave., Chicago 37, Ill.
Z & W Machine Products Inc., Electronics Div., 5151 St. Clair Ave., Cleveland 3, Ohio.

COUNTERS, ELECTRON AND NUCLEAR

See Indicators, Geiger Counter or Counters, Radiation

COUPLERS—*Directional*

Hansell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ C. G. S. LABORATORIES INC., 36 Ludlow St., Stamford, Conn. ADV. PG. 244.
Ⓥ Gates Radio Co., Quincy, Ill.
Ⓥ JONES ELECTRONICS CO., M. C., Bristol, Conn. ADV. PG. 138.
Ⓥ Manufacturers Thread Grinding, Inc., P. O. Box 69, Jamaica, N. Y.
Ⓥ Microwave Equipment Co., Inc., North Caldwell, N. J.
Ⓥ POLYTECHNIC RESEARCH & DEVELOPMENT CO., INC., 202 Tillary St., Brooklyn 1, N. Y. ADV. PG. 52.
Ⓥ SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.
Ⓥ Varian Associates, 99 Washington St., San Carlos, Calif.
VECTRON, INC., 235 High St., Waltham, Mass. ADV. PG. 266.

COUPLINGS, SHAFT—*Reducers and Extensions*

Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Birnbach Radio Co., Inc., 145 Hudson St., New York, N. Y.
Ⓥ Bud Radio Inc., 2118 E. 55th St., Cleveland 3, Ohio.
Ⓥ Cinaudagraph Co., 233 E. 146th St., New York 51, N. Y.
Ⓥ Elliott Mfg. Co., 218 Prospect Ave., Binghamton, N. Y.
Ⓥ INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
Ⓥ Johnson Co., E. F., Waseca, Minn.
Ⓥ Kuprian Mfg. Co., 310 State St., Binghamton, N. Y.
Ⓥ Miller Mfg. Co., James, 150 Exchange St., Malden, Mass.
Ⓥ NATIONAL CO., INC., 61 Sherman St., Malden 48, Mass. ADV. PG. 33 to 36.
Ⓥ Precis Mfg. Corp., 110 E. 42nd St., New York 17, N. Y.
Ⓥ Reeves Instrument Corp., 215 E. 91st St., New York, N. Y.
Ⓥ Servo, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.

COUPLINGS, SHAFT—*Rigid & Flexible*

Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Birnbach Radio Co., Inc., 145 Hudson St., New York, N. Y.
Ⓥ Bud Radio Inc., 2118 E. 55th St., Cleveland 3, Ohio.
Ⓥ Cinaudagraph Mfg. Co., Allen D., 97 Whiting St., Plainville, Conn.
Ⓥ Elliott Mfg. Co., 218 Prospect Ave., Binghamton, N. Y.
Ⓥ FEDERAL SCREW PRODUCTS INC., 224 W. Huron St., Chicago 10, Ill. ADV. PG. 271.
Ⓥ Johnson Co., E. F., Waseca, Minn.
Ⓥ Koppers Co. Inc., Chemical Div., Koppers Bldg., Pittsburgh 19, Pa.
Ⓥ Kuprian Mfg. Co., 350 State St., Binghamton, N. Y.
Ⓥ LORD MFG. CO., 1635 W. 12th St., Erie, Pa. ADV. PG. 53.
Ⓥ Miller Mfg. Co., James, 150 Exchange St., Malden, Mass.
Ⓥ NATIONAL CO., INC., 61 Sherman St., Malden 48, Mass. ADV. PG. 33 to 36.
Ⓥ Precis Mfg. Corp., 110 E. 42nd St., New York 17, N. Y.
Ⓥ Reeves Instrument Corp., 215 E. 91st St., New York, N. Y.
Ⓥ Servo, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.
Ⓥ STEWART MFG. CO., F. W., 8321 Ravenswood Ave., Chicago 13. ADV. PG. 264.
Ⓥ Waite General Mfg. Co., S. S. Industrial Div., 16 E. 40th St., New York, N. Y.

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

CRYSTAL ANALYSIS EQUIPMENT

Ⓥ Berkshire Laboratories, P. O. Box 70, Concord, Mass.
Ⓥ CLARK CRYSTAL CO., 2 Farm Rd., Marlboro, Mass. ADV. PG. 210.
Ⓥ ELECTRONIC MEASUREMENTS CO., Red Bank, N. J. ADV. PG. 139.
Ⓥ General Electric X-Ray Corp., 4855 W. McGeoch Ave., Milwaukee, Wis.
Ⓥ KAY ELECTRIC CO., 14 Maple Ave., Pine Brook, N. J. ADV. PG. 193.
Ⓥ LAVOIE LABORATORIES, Morganville, N. J. ADV. PG. 151.
Ⓥ North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
Ⓥ REEVES-HOFFMAN CORP., 321 Cherry St., Carlisle, Pa. ADV. PG. 32.

CRYSTAL CARTRIDGES

Ⓥ American Microphone Co., 370 S. Fair Oaks Ave., Pasadena 1, Calif.
Ⓥ Astatic Corp., The Conneaut, Ohio.
Atlas Electric Products Co., P. O. Box 1591, Erie, Pa.
Ⓥ BRUSH DEVELOPMENT CO., 3405 Perkins Ave., Cleveland 14, Ohio. ADV. PG. 124, 125.
Ⓥ ELECTRO-VOICE, INC., Buchanan, Mich. ADV. PG. 207.
Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
Ⓥ SHURE BROTHERS, INC., 225 W. Huron St., Chicago 10, Ill. ADV. PG. 19.
Ⓥ TURNER CO., THE, 909 17th St., N. E., Cedar Rapids, Iowa. ADV. PG. 54.
Ⓥ Webster Electric Co., 1900 Clark St., Racine, Wis.

CRYSTAL DIODES

See Crystals, Germanium
Crystals, Silicon

CRYSTALS—*Frequency Control*

Ⓥ Bassett, Inc., Rex, 307-11 N. W. 1st Ave., Ft. Lauderdale, Fla.
Ⓥ BLILEY ELECTRIC CO., Union Station Bldg., Erie, Pa. ADV. PG. 136.
Ⓥ Breon Labs., 1520 Evergreen Rd., Williamsport, Pa.
Burnett Radio Lab., Wm. W. L., 4814 Idaho St., San Diego, Calif.
Ⓥ CLARK CRYSTAL CO., 2 Farm Rd., Marlboro, Mass. ADV. PG. 210.
Ⓥ Crystal Research Labs., Inc., 29 Allyn St., Hartford, Conn.
Dallons Labs., 5066 Santa Monica Blvd., Los Angeles, Calif.
Ⓥ Eidson Electronic Co., 1802 N. Third St., Temple, Texas.
Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
Ⓥ HUNT CORP., THE, 455 Lincoln St., Carlisle, Pa. ADV. PG. 84.
Ⓥ Kaar Engineering Co., 2995 Middlefield Rd., Palo Alto, Calif.
Ⓥ KNIGHTS CO., JAMES, 131 S. Wells St., Sandwich, Ill. ADV. PG. 190.
Ⓥ Miller, August E., 9226 Hudson Blvd., North Bergen, N. J.
Monitor Products Co., 815 Fremont St., So. Pasadena, Calif.
Ⓥ Nebel Lab., R. E., 1104 Lincoln Place, Brooklyn 13, N. Y.
Ⓥ NORRMAN LABORATORIES, ERNST, Williams Bay, Wis. ADV. PG. 177.
Ⓥ Piezo Products Co., Whitney St., Framingham, Mass.
Ⓥ Polytech Devices, Inc., 1180½ E. Grand St., Elizabeth, N. J.
Ⓥ Precision Piezo Service, 427 Mayflower St., Baton Rouge, La.
Ⓥ Premier Crystal Labs., Inc., 79-89 Seventh Ave., New York 11, N. Y.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
Radio Specialty Mfg. Co., 2023 S. E. Sixth Ave., Portland 14, Ore.
Ⓥ REEVES-HOFFMAN CORP., 321 Cherry St., Carlisle, Pa. ADV. PG. 32.
Ⓥ Scientific Radio Products Co., 738 W. Broadway, Council Bluffs, Iowa.
Ⓥ Scientific Radio Service, 4301 Sheridan St., University Park, Md.
Ⓥ Sentry Crystal Co., 206 S. W. Washington St., Portland 4, Ore.
Ⓥ Standard Crystal Co., 400 Armstrong Ave., Kansas City 7, Kans.
Ⓥ Standard Piezo Co., 127 Cedar St., Carlisle, Pa.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ Valpey Crystals, Highland St., Holliston, Mass.
West Coast Electronics Co., 1601 S. Burlington St., Los Angeles 6, Calif.
Westline Electronics Co., 11660 Olympic Blvd., Los Angeles 25, Calif.

CRYSTALS—*Frequency Multiplier*

Ⓥ BLILEY ELECTRIC CO., Union Station Bldg., Erie, Pa. ADV. PG. 136.
Ⓥ Breon Labs., 1520 Evergreen Rd., Williamsport, Pa.
Burnett Radio Lab., Wm. W. L., 4814 Idaho St., San Diego, Calif.
Ⓥ CLARK CRYSTAL CO., 2 Farm Rd., Marlboro, Mass. ADV. PG. 210.
Ⓥ Crystal Research Labs., Inc., 29 Allyn St., Hartford, Conn.
Ⓥ Eidson Electronic Co., 1802 N. Third St., Temple, Texas.
Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
Ⓥ HUNT CORP., THE, 455 Lincoln St., Carlisle, Pa. ADV. PG. 84.
Ⓥ KNIGHTS CO., JAMES, 131 S. Wells St., Sandwich, Ill. ADV. PG. 190.
Monitor Products Co., 815 Fremont St., So. Pasadena, Calif.
Ⓥ Nebel Lab., R. E., 1104 Lincoln Place, Brooklyn 13, N. Y.
Ⓥ Polytech Devices, Inc., 1180½ E. Grand St., Elizabeth, N. J.
Ⓥ Premier Crystal Labs., Inc., 79-89 Seventh Ave., New York 11, N. Y.
Radio Specialty Mfg. Co., 2023 S. E. Sixth Ave., Portland 14, Ore.
Ⓥ REEVES-HOFFMAN CORP., 321 Cherry St., Carlisle, Pa. ADV. PG. 32.
Ⓥ Scientific Radio Products Co., 738 W. Broadway, Council Bluffs, Iowa.
Ⓥ Standard Piezo Co., 127 Cedar St., Carlisle, Pa.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ Valpey Crystals, Highland St., Holliston, Mass.
West Coast Electronics Co., 1601 S. Burlington St., Los Angeles 6, Calif.
Westline Electronics Co., 11660 Olympic Blvd., Los Angeles 25, Calif.

CRYSTALS—*Frequency Standard*

Ⓥ BLILEY ELECTRIC CO., Union Station Bldg., Erie, Pa. ADV. PG. 136.
Ⓥ Breon Labs., 1520 Evergreen Rd., Williamsport, Pa.
Burnett Radio Lab., Wm. W. L., 4814 Idaho St., San Diego, Calif.
Ⓥ CLARK CRYSTAL CO., 2 Farm Rd., Marlboro, Mass. ADV. PG. 210.
Dallons Labs., 5066 Santa Monica Blvd., Los Angeles, Calif.
Ⓥ ELECTRONIC MEASUREMENTS CO., Red Bank, N. J. ADV. PG. 139.
Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Ⓥ HUNT CORP., THE, 455 Lincoln St., Carlisle, Pa. ADV. PG. 84.
Ⓥ KNIGHTS CO., JAMES, 131 S. Wells St., Sandwich, Ill. ADV. PG. 190.
Ⓥ Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.
Ⓥ Miller, August E., 9226 Hudson Blvd., North Bergen, N. J.
Monitor Products Co., 815 Fremont St., So. Pasadena, Calif.
Ⓥ Nebel Lab., R. E., 1104 Lincoln Place, Brooklyn 13, N. Y.
Ⓥ NORRMAN LABORATORIES, ERNST, Williams Bay, Wis. ADV. PG. 177.
Ⓥ Polytech Devices, Inc., 1180½ E. Grand St., Elizabeth, N. J.
Ⓥ Premier Crystal Labs., Inc., 79-89 Seventh Ave., New York 11, N. Y.
Ⓥ Precision Piezo Service, 427 Mayflower St., Baton Rouge, La.
Radio Specialty Mfg. Co., 2023 S. E. Sixth Ave., Portland 14, Oregon.
Ⓥ REEVES-HOFFMAN CORP., 321 Cherry St., Carlisle, Pa. ADV. PG. 32.
Ⓥ Standard Crystal Co., 400 Armstrong Ave., Kansas City 7, Kans.
Ⓥ Standard Piezo Co., 127 Cedar St., Carlisle, Pa.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ Valpey Crystals, Highland St., Holliston, Mass.
West Coast Electronics Co., 1601 S. Burlington St., Los Angeles 6, Calif.
Westline Electronics Co., 11660 Olympic Blvd., Los Angeles 25, Calif.

CRYSTALS—*Germanium*

Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
Ⓥ GENERAL ELECTRIC CO., Electronics Dept. Tube Div., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 244, 247.
Kemtron Electron Products, Inc., 23 Brown St., Salem, Mass.
Ⓥ SYLVANIA ELECTRIC PRODUCTS, INC., 1740 Broadway, New York 19, N. Y. ADV. PG. 286 to 290.

CRYSTALS—*I-f Filter*

Ⓥ BLILEY ELECTRIC CO., Union Station Bldg., Erie, Pa. ADV. PG. 136.
Ⓥ Breon Labs., 1520 Evergreen Rd., Williamsport, Pa.
Ⓥ CLARK CRYSTAL CO., 2 Farm Rd., Marlboro, Mass. ADV. PG. 210.
Ⓥ Collins Radio Co., Cedar Rapids, Iowa.
Ⓥ Crystal Research Labs., Inc., 29 Allyn St., Hartford, Conn.
Dallons Labs., 5066 Santa Monica Blvd., Los Angeles, Calif.
Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
Ⓥ KNIGHTS CO., JAMES, 131 S. Wells St., Sandwich, Ill. ADV. PG. 190.
Ⓥ Miller, August E., 9226 Hudson Blvd., North Bergen, N. J.
Monitor Products Co., 815 Fremont St., So. Pasadena, Calif.
Ⓥ Nebel Lab., R. E., 1104 Lincoln Place, Brooklyn 13, N. Y.
Ⓥ Polytech Devices, Inc., 1180½ E. Grand St., Elizabeth, N. J.
Ⓥ Premier Crystal Labs., Inc., 79-89 Seventh Ave., New York 11, N. Y.
Radio Specialty Mfg. Co., 2023 S. E. Sixth Ave., Portland 14, Ore.
Ⓥ REEVES-HOFFMAN CORP., 321 Cherry St., Carlisle, Pa. ADV. PG. 32.
Ⓥ Scientific Radio Products Co., 738 W. Broadway, Council Bluffs, Iowa.
Ⓥ Standard Crystal Co., 400 Armstrong Ave., Kansas City 7, Kans.
Ⓥ Standard Piezo Co., 127 Cedar St., Carlisle, Pa.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ Valpey Crystals, Highland St., Holliston, Mass.
Westline Electronics Co., 11660 Olympic Blvd., Los Angeles 25, Calif.

CRYSTALS—*Microwave*

Ⓥ CLARK CRYSTAL CO., 2 Farm Rd., Marlboro, Mass. ADV. PG. 210.
Ⓥ Microwave Equipment Co., Inc., North Caldwell, N. J.
Westline Electronics Co., 11660 Olympic Blvd., Los Angeles 25, Calif.

CRYSTALS—*Piezoelectric*

Atlas Electric Products Co., P. O. Box 1591, Erie, Pa.
Ⓥ Bassett Inc., Rex, 307-11 N. W. 1st Ave., Ft. Lauderdale, Fla.
Ⓥ Bausch & Lomb Optical Co., 635 St. Paul St., Rochester 2, N. Y.
Ⓥ BLILEY ELECTRIC CO., Union Station Bldg., Erie, Pa. ADV. PG. 136.
Ⓥ Breon Laboratories, 1520 Evergreen Rd., Williamsport, Pa.
Ⓥ BRUSH DEVELOPMENT CO., 3405 Perkins Ave., Cleveland 14, Ohio. ADV. PG. 124, 125.
Burnett Radio Lab., Wm. W. L., 4814 Idaho St., San Diego, Calif.
Ⓥ CLARK CRYSTAL CO., 2 Farm Rd., Marlboro, Mass. ADV. PG. 210.
Ⓥ Crystal Research Labs., Inc., 29 Allyn St., Hartford, Conn.
Ⓥ Diamond Drill Carbon Co., 53-63 Park Row, New York 7, N. Y.
Ⓥ Eidson Electronic Co., 1802 N. Third St., Tempel, Texas.
Edo Corp., College Point, Long Island, N. Y.
Ⓥ GULTON MFG. CORP., Metuchen, N. J. ADV. PG. 262.
Ⓥ HUNT CORP., THE, 455 Lincoln St., Carlisle, Pa. ADV. PG. 84.
Ⓥ Kaar Engineering Co., 2995 Middlefield Rd., Palo Alto, Calif.
Ⓥ KNIGHTS CO., JAMES, 131 S. Wells St., Sandwich, Ill. ADV. PG. 190.
Monitor Products Co., 815 Fremont Ave., So. Pasadena, Calif.
Ⓥ Nebel Lab., R. E., 1104 Lincoln Pl., Brooklyn 13, N. Y.
Ⓥ Polytech Devices, Inc., 1180½ E. Grand St., Elizabeth, N. J.
Ⓥ Precision Piezo Service, 427 Mayflower St., Baton Rouge, La.
Ⓥ Premier Crystal Labs., Inc., 79-89 Seventh Ave., New York 11, N. Y.
Radio Specialty Mfg. Co., 2023 S. E. Sixth Ave., Portland 14, Ore.
Ⓥ REEVES-HOFFMAN CORP., 321 Cherry St., Carlisle, Pa. ADV. PG. 32.
Ⓥ Sentry Crystal Co., 206 S. W. Washington St., Portland 4, Ore.
Ⓥ Standard Crystal Co., 400 Armstrong Ave., Kansas City 7, Kans.
Ⓥ Standard Piezo Co., 127 Cedar St., Carlisle, Pa.
Ⓥ Tibbets Industries, Inc., Camden, Maine.
Ⓥ Valpey Crystals, Highland St., Holliston, Mass.
Westline Electronics Co., 11660 Olympic Blvd., Los Angeles 25, Calif.

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

CRYSTALS—*Quartz*

Atlas Electric Products Co., P. O. Box 1591, Erie, Pa.
Ⓥ Bassett Inc., Rex, 307-11 N. W. 1st Ave., Ft. Lauderdale, Fla.
Ⓥ BLILEY ELECTRIC CO., Union Station Bldg., Erie, Pa. ADV. PG. 136.
Ⓥ Brown Labs., 1520 Evergreen Rd., Williamsport, Pa.
Ⓥ CLARK CRYSTAL CO., 2 Farm Rd., Marlboro, Mass. ADV. PG. 210.
Ⓥ Crystal Research Labs., Inc., 29 Allyn St., Hartford, Conn.
Dalton Labs., 1046 Santa Monica Blvd., Los Angeles, Calif.
Diamond Drill Carbon Co., 53-63 Park Row, New York 7, N. Y.
Ⓥ Eldson Electronic Co., 1802 N. Third St., Temple, Texas.
Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
Ⓥ HUNT CORP., THE, 455 Lincoln St., Carlisle, Pa. ADV. PG. 84.
Ⓥ Kear Engineering Co., 2995 Middlefield Rd., Palo Alto, Calif.
Ⓥ KNIGHTS CO., JAMES, 131 S. Wells St., Sandwich, Ill. ADV. PG. 190.
Ⓥ Miller, August E., 9226 Hudson Blvd., North Bergen, N. J.
Monitor Products Co., 815 Fremont St., South Pasadena, Calif.
Ⓥ Nedit Lab., R. E., 1104 Lincoln Pl., Brooklyn 13, N. Y.
Ⓥ Northern Radio Co., 314 Bell St., Seattle 1, Wash.
Plaza Products Co., Whitney St., Framingham, Mass.
Ⓥ Polytech Devices, Inc., 11801½ E. Grand St., Elizabeth, N. J.
Ⓥ Precision Piezo Service, 427 Mayflower St., Baton Rouge, La.
Ⓥ Premier Crystal Labs., Inc., 79-89 Seventh Ave., New York 11, N. Y.
Radio Specialty Mfg. Co., 2023 S. E. 6th Ave., Portland 14, Ore.
Ⓥ REEVES-HOFFMAN CORP., 321 Cherry St., Carlisle, Pa. ADV. PG. 32.
Ⓥ Scientific Radio Products Co., 738 W. Broadway, Council Bluffs, Iowa.
Ⓥ Sentry Crystal Co., 206 S. W. Washington St., Portland 4, Ore.
Ⓥ Standard Crystal Co., 400 Armstrong Ave., Kansas City 7, Kans.
Ⓥ Standard Piezo Co., 127 Cedar St., Carlisle, Pa.
Ⓥ Valpey Crystals, Highland St., Holliston, Mass.
Westline Electronics Co., 11660 Olympic Blvd., Los Angeles 25, Calif.

CRYSTALS—*Receiver Control*

Ⓥ Bassett Inc., Rex, 307-11 N. W. 1st Ave., Ft. Lauderdale, Fla.
Ⓥ BLILEY ELECTRIC CO., Union Station Bldg., Erie, Pa. ADV. PG. 136.
Ⓥ Brown Laboratories, 1520 Evergreen Rd., Williamsport, Pa.
Ⓥ CLARK CRYSTAL CO., 2 Farm Rd., Marlboro, Mass. ADV. PG. 210.
Ⓥ Crystal Research Labs., Inc., 29 Allyn St., Hartford, Conn.
Ⓥ Eldson Electronic Co., 1802 N. Third St., Temple, Texas.
Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
Ⓥ HUNT CORP., THE, 455 Lincoln St., Carlisle, Pa. ADV. PG. 84.
Ⓥ Kear Engineering Co., 2995 Middlefield Rd., Palo Alto, Calif.
Ⓥ KNIGHTS CO., JAMES, 131 S. Wells St., Sandwich, Ill. ADV. PG. 190.
Ⓥ Miller, August E., 9226 Hudson Blvd., North Bergen, N. J.
Monitor Products Co., 815 Fremont Ave., So. Pasadena, Calif.
Ⓥ Nedit Lab., R. E., 1104 Lincoln Pl., Brooklyn 13, N. Y.
Ⓥ Polytech Devices, Inc., 11801½ E. Grand St., Elizabeth, N. J.
Ⓥ Precision Piezo Service, 427 Mayflower St., Baton Rouge, La.
Ⓥ Premier Crystal Labs., Inc., 79-89 Seventh Ave., New York 11, N. Y.
Radio Specialty Mfg. Co., 2023 S. E. Sixth Ave., Portland 14, Ore.
Ⓥ REEVES-HOFFMAN CORP., 321 Cherry St., Carlisle, Pa. ADV. PG. 32.
Ⓥ Scientific Radio Service, 4301 Sheridan St., University Park, Md.
Ⓥ Sentry Crystal Co., 206 S. Washington St., Portland 4, Ore.
Ⓥ Standard Crystal Co., 400 Armstrong Ave., Kansas City 7, Kans.
Ⓥ Standard Piezo Co., 127 Cedar St., Carlisle, Pa.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ Valpey Crystals, Highland St., Holliston, Mass.
Westline Electronics Co., 11660 Olympic Blvd., Los Angeles 25, Calif.

CRYSTALS—*Rochelle Salt*

Ⓥ BRUSH DEVELOPMENT CO., 3405 Perkins Ave., Cleveland 14, Ohio. ADV. PG. 124, 125.
Tibbetts Industries, Inc., Camden, Maine.

CRYSTALS—*Scintillation Counter*

Ⓥ ATOMIC INSTRUMENT CO., 160 Charles St., Boston, Mass. ADV. PG. 218.
Ⓥ MACDONALD CO., INC., W. S., 31 University Rd., Cambridge 38, Mass. ADV. PG. 218.
Ⓥ Manufacturers Engr. & Equip. Corp., Willow Grove, Pa.
Ⓥ Standard Electronics Research Corp., 2 East End Ave., New York 21, N. Y.

CRYSTALS—*Silicon*

Dalton Labs., 1046 Santa Monica Blvd., Los Angeles, Calif.
Ⓥ Fenstron Electron Products, Inc., 23 Brown St., Salem, Mass.
Ⓥ Standard Piezo Co., 127 Cedar St., Carlisle, Pa.
Ⓥ SYLVANIA ELECTRIC PRODUCTS, INC., 1740 Broadway, New York 19, N. Y. ADV. PG. 286 to 290.

CRYSTALS—*Tourmaline*

Ⓥ CAMBRIDGE THERMIONIC CORP., 445 Concord Ave., Cambridge, Mass. ADV. PG. 72.
Ⓥ CLARK CRYSTAL CO., 2 Farm Rd., Marlboro, Mass. ADV. PG. 210.
Ⓥ Crystal Research Labs., Inc., 29 Allyn St., Hartford, Conn.
Diamond Drill Carbon Co., 53-63 Park Row, New York 7, N. Y.
Ⓥ KNIGHTS CO., JAMES, 131 S. Wells St., Sandwich, Ill. ADV. PG. 190.
Ⓥ Miller, August E., 9226 Hudson Blvd., North Bergen, N. J.
Ⓥ Polytech Devices, Inc., 11801½ E. Grand St., Elizabeth, N. J.
Ⓥ Premier Crystal Labs., Inc., 79-89 Seventh Ave., New York 11, N. Y.
Ⓥ Valpey Crystals, Highland St., Holliston, Mass.

CRYSTALS—*Ultrasonic*

Ⓥ BLILEY ELECTRIC CO., Union Station Bldg., Erie, Pa. ADV. PG. 136.
Ⓥ Brown Labs., 1520 Evergreen Rd., Williamsport, Pa.
Ⓥ BRUSH DEVELOPMENT CO., 3405 Perkins Ave., Cleveland 14, Ohio. ADV. PG. 124, 125.
Ⓥ CLARK CRYSTAL CO., 2 Farm Rd., Marlboro, Mass. ADV. PG. 210.
Ⓥ Crystal Research Labs., Inc., 29 Allyn St., Hartford, Conn.
Ⓥ Edo Corp., College Point, Long Island, N. Y.
Ⓥ Eldson Electronic Co., 1802 N. Third St., Temple, Texas.
Ⓥ KNIGHTS CO., JAMES, 131 S. Wells St., Sandwich, Ill. ADV. PG. 190.
Ⓥ Miller, August E., 9226 Hudson Blvd., North Bergen, N. J.
Monitor Products Co., 815 Fremont St., So. Pasadena, Calif.
Ⓥ Plaza Products Co., Whitney St., Framingham, Mass.
Ⓥ Polytech Devices, Inc., 11801½ E. Grand St., Elizabeth, N. J.
Ⓥ Precision Piezo Service, 427 Mayflower St., Baton Rouge, La.
Ⓥ Premier Crystal Labs., Inc., 79-89 Seventh Ave., New York 11, N. Y.
Ⓥ REEVES-HOFFMAN CORP., 321 Cherry St., Carlisle, Pa. ADV. PG. 32.
Ⓥ Standard Crystal Co., 400 Armstrong Ave., Kansas City 7, Kans.
Ⓥ Standard Piezo Co., 127 Cedar St., Carlisle, Pa.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ Valpey Crystals, Highland St., Holliston, Mass.
Westline Electronics Co., 11660 Olympic Blvd., Los Angeles 25, Calif.

CYCLOTRONS

Ⓥ Collins Radio Co., Cedar Rapids, Iowa.
Ⓥ GENERAL ELECTRIC CO., Apparatus Div., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.

DECADE BOXES—*Capacitance*

Ⓥ CINEMA ENGINEERING CO., 1510 W. Verdugo Ave., Burbank, Calif. ADV. PG. 196.
Ⓥ Dole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ CORNELL-DUBILIER ELECTRIC CORP., South Plainfield, N. J. ADV. PG. 70.
Ⓥ FREED TRANSFORMER CO., INC., 1726 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 144.
Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Ⓥ Industrial Instruments, Inc., 17 Pollack Ave., Jersey City 5, N. J.
Ⓥ Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
Metropolitan Electronics & Instruments Co., 106 Fifth Ave., New York 11, N. Y.
Ⓥ MUIRHEAD & CO., LTD., Beckenham, Kent, England. ADV. PG. 71.
Ⓥ Oak Ridge Products Mfg. Div. of Video Television, Inc., 239 E. 127th St., New York 35, N. Y.
Ⓥ RADIO FREQUENCY LABS., INC., Boonton 2, N. J. ADV. PG. 172.
Ⓥ Special Products Co., 9115 Brookville Rd., P. O. Box 471, Silver Spring, Md.
Ⓥ UNITED CONDENSER CORP., 337 E. 134th St., New York 54, N. Y. ADV. PG. 236.

DECADE BOXES—*Inductance*

Ⓥ BURNELL & CO., 45 Warburton Ave., Yonkers 2, N. Y. ADV. PG. 69.
Ⓥ CINEMA ENGINEERING CO., 1510 W. Verdugo Ave., Burbank, Calif. ADV. PG. 196.
Ⓥ Dole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ FREED TRANSFORMER CO., INC., 1726 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 144.
Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Ⓥ Hycor Co., 11423 Vanowen St., North Hollywood, Calif.
Metropolitan Electronics & Instruments Co., 106 Fifth Ave., New York 11, N. Y.

DECADE BOXES—*Resistance*

Ⓥ Analysis Instrument Co., P. O. Box 231, East Paterson, N. J.
Ⓥ Berkshire Laboratories, P. O. Box 70, Concord, Mass.
Ⓥ BROWN ELECTRO-MEASUREMENT CORP., 4637 S. E. Hawthorne Blvd., Portland 15, Oregon. ADV. PG. 276.
Hycor Co., 11423 Vanowen St., North Hollywood, Calif.
Ⓥ Industrial Instruments, Inc., 17 Pollack Ave., Jersey City 5, N. J.
Ⓥ INSTRUMENT RESISTORS CO., 1076 Commerce Ave., Union, N. J. ADV. PG. 174, 175.
Ⓥ Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
Ⓥ Marma Electronic Co., 703 Willow St., Chicago 14, Ill.
Metropolitan Electronics & Instruments Co., 106 Fifth Ave., New York 11, N. Y.
Ⓥ MUIRHEAD & CO., Ltd., Beckenham, Kent, England. ADV. PG. 71.
Ⓥ Oak Ridge Products Mfg. Div. of Video Television, Inc., 239 E. 127th St., New York 35, N. Y.
Ⓥ OHMITE MFG. CO., 4835 W. Flournoy St., Chicago 44, Ill. ADV. PG. 83.
Ⓥ RADIO FREQUENCY LABS., INC., Boonton 2, N. J. ADV. PG. 172.
Ⓥ Rubicon Co., 3751 Ridge Ave., Philadelphia, Pa.
Ⓥ SHALLCROSS MFG. Co., 10 Jackson Ave., Collingdale, Pa. ADV. PG. 221.
Ⓥ Special Products Co., 9115 Brookville Rd., P. O. Box 471, Silver Spring, Md.
Stott Co., Inc., Herman H., 27 Park Place, New York 7, N. Y.
Ⓥ Tech Laboratories, Inc., Bergen & Edsall Blvds., Palisades Park, N. J.
Ⓥ Technology Instrument Corp., 1058 Main St., Waltham 54, Mass.

DEFLECTION YOKES

See Yokes, Deflection

DEHYDRATORS—*Automatic*

Ⓥ Andrew Corp., 363 E. 75th St., Chicago 19, Ill.
Ⓥ Bowser, Inc., Refrigeration Div., Terryville, Conn.
Ⓥ Communication Products Co., Inc., Broadway & Clark St., Keyport, N. J.
Ⓥ Product Development Co., Inc., Arlington, N. J.

DENSITOMETERS

Ⓥ Bausch & Lomb Optical Co., 635 St. Paul St., Rochester 2, N. Y.
Davies Laboratories, Inc., 4705 Queensbury Rd., Riverdale, Md.

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Photovolt Corp., 95 Madison Ave., New York 16, N. Y.
(V)Welch Scientific Co., W. M., 1515 Sedgwick St., Chicago 10, Ill.
(V)**WESTON ELECTRICAL INSTRUMENT CORP.**, 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

DERMOHMETERS

(V)Electro-Medical Lab. Inc., Hollister, Mass.

DETECTORS—*Alpha*

(V)Anton Electronic Laboratories, Inc., 1226-1238 Flushing Ave., Brooklyn 6, N. Y.
(V)Applied Physics Corp., 30 W. Green St., Pasadena 1, Calif.
(V)**ATOMIC INSTRUMENT CO.**, 160 Charles St., Boston, Mass. ADV. PG. 218.
(V)**BARKER & WILLIAMSON**, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
(V)Clarkstan Corp., 11927 S. W. Pico Blvd., Los Angeles 64, Calif.
Electronic Products Co., 111 E. 3rd St., Mt. Vernon, N. Y.
(V)**EL-TRONICS, INC.**, 2649 N. Howard St., Philadelphia 33, Pa. ADV. PG. 238.
(V)Fisher Research Lab., 1961 University Ave., Palo Alto, Calif.
(V)**GENERAL RADIO CO.**, 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Harshaw Scientific Div. of The Harshaw Chemical Co., 1945 E. 97th St., Cleveland 6, Ohio.
(V)Kelley-Koett Mfg. Co., Instrument Div., 12 E. 6th St., Covington, Ky.
(V)**MACDONALD CO., INC.**, W. S., 33 University Rd., Cambridge 38, Mass. ADV. PG. 218.
(V)Manufacturers Engr. & Equip. Corp., Willow Grove, Pa.
(V)North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
(V)Nuclear Development Lab., P. O. Box 7034, Kansas City, Mo.
(V)Nuclear Instrument & Chemical Corp., 223 W. Erie St., Chicago 10, Ill.
(V)Nucleonic Corp. of America, The, 497 Union St., Brooklyn 31, N. Y.
(V)Radiation Counter Laboratories, Inc., 1844 W. 21st St., Chicago 8, Ill.
(V)**RADIO CORP. OF AMERICA**, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
(V)Radioactive Products, Inc., 3201 E. Woodbridge St., Detroit 7, Mich.
(V)Technical Associates, 3730 San Fernando Rd., Glendale 4, Calif.
(V)Tracerlab, Inc., 130 High St., Boston 10, Mass.
(V)**VICTOREEN INSTRUMENT CO.**, 5806 Hough Ave., Cleveland 3, Ohio. ADV. PG. 241.
Z & W Machine Products Inc., Electronics Div., 5151 St. Clair Ave., Cleveland 3, Ohio.

DETECTORS—*Beta*

(V)Anton Electronic Laboratories, Inc., 1226-1238 Flushing Ave., Brooklyn 6, N. Y.
(V)Applied Physics Corp., 30 W. Green St., Pasadena 1, Calif.
(V)**ATOMIC INSTRUMENT CO.**, 160 Charles St., Boston, Mass. ADV. PG. 218.
(V)**BARKER & WILLIAMSON**, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Electronic Products Co., 111 E. 3rd St., Mt. Vernon, N. Y.
(V)**EL-TRONICS, INC.**, 2649 N. Howard St., Philadelphia 33, Pa. ADV. PG. 238.
(V)Fisher Research Lab., 1961 University Ave., Palo Alto, Calif.
(V)Forty Niner Co., 5245 Grand River, Detroit 8, Mich.
(V)**GENERAL RADIO CO.**, 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
(V)Geophysical Instrument Co., 1820 N. Nash St., Arlington, Va.
Harshaw Scientific Div. of The Harshaw Chemical Co., 1945 E. 97th St., Cleveland 6, Ohio.
(V)Kelley-Koett Mfg. Co., Instrument Div., 12 E. 6th St., Covington, Ky.
(V)**MACDONALD CO., INC.**, W. S., 33 University Rd., Cambridge 38, Mass. ADV. PG. 218.
(V)Manufacturers Engr. & Equip. Corp., Willow Grove, Pa.
(V)North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
(V)Nuclear Development Lab., P. O. Box 7034, Kansas City, Mo.
(V)Nuclear Instrument & Chemical Corp., 223 W. Erie St., Chicago 10, Ill.
(V)Nucleonic Corp. of America, The, 497 Union St., Brooklyn 31, N. Y.
(V)Radiation Counter Laboratories, Inc., 1844 W. 21st St., Chicago 8, Ill.
(V)**RADIO CORP. OF AMERICA**, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
(V)Radioactive Products, Inc., 3201 E. Woodbridge St., Detroit 7, Mich.
(V)Special Instruments Laboratory, Inc., 1003 Highland Ave., Knoxville, Tenn.
(V)Technical Associates, 3730 San Fernando Rd., Glendale 4, Calif.
(V)Tracerlab, Inc., 130 High St., Boston 10, Mass.
(V)**VICTOREEN INSTRUMENT CO.**, 5806 Hough Ave., Cleveland 3, Ohio. ADV. PG. 241.
Z & W Machine Products Inc., Electronics Div., 5151 St. Clair Ave., Cleveland 3, Ohio.

DETECTORS—*Crystal*

(V)Anton Electronic Laboratories, Inc., 1226-1238 Flushing Ave., Brooklyn 6, N. Y.
(V)Feiler Engineering Co., 1601 S. Federal St., Chicago 16, Ill.
(V)**GENERAL ELECTRIC CO.**, Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
(V)Kemtron Electron Products, Inc., 23 Brown St., Salem, Mass.
(V)Microwave Equipment Co., Inc., North Caldwell, N. J.
(V)Philmore Mfg. Co., 113 University Place, New York 3, N. Y.
(V)**SPERRY GYROSCOPE CO.**, Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.
(V)**SYLVANIA ELECTRIC PRODUCTS, INC.**, 1740 Broadway, New York 19, N. Y. ADV. PG. 286 to 290.

DETECTORS—*Crystal Germanium*

See Crystals, Germanium

DETECTORS—*Crystal Silicon*

See Crystals, Silicon

DETECTORS—*Explosive Gas*

(V)Baird Associates, Inc., 33 University Rd., Cambridge 38, Mass.

DETECTORS—*Fire*

(V)American Communications Corp., 306 Broadway, New York 7, N. Y.
(V)C-O-Two Fire Equipment Co., P. O. Box 390, U. S. Highway 1, Newark 1, N. J.
(V)**EL-TRONICS, INC.**, 2649 N. Howard St., Philadelphia 33, Pa. ADV. PG. 238.
(V)Fenwal, Inc., 41A Pleasant St., Ashland, Mass.
Lumenite Electric Co., 407 S. Dearborn St., Chicago, Ill.
(V)Technical Associates, 3730 San Fernando Rd., Glendale 4, Calif.

DETECTORS—*Flaw & Defect*

(V)**GENERAL ELECTRIC CO.**, Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Magnetic Analysis Corp., 42-44 Twelfth St., Long Island City, N. Y.
(V)Photovolt Company, 116 Nassau St., New York 7, N. Y.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
(V)**SPERRY PRODUCTS, INC.**, Danbury, Conn. ADV. PG. 54.
(V)Teipletf & Barton, Inc., 831 N. Lake St., Burbank, Calif.
(V)Vacuum Electronic Engineering Co., 316 37th St., Brooklyn 2, N. Y.

DETECTORS—*Galena*

(V)Carron Mfg. Co., 415 S. Aberdeen St., Chicago, Ill.
(V)Philmore Mfg. Co., 113 University Place, New York 3, N. Y.

DETECTORS—*Impedance*

(V)**GENERAL ELECTRIC CO.**, Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
(V)**GENERAL RADIO CO.**, 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
(V)**POLYTECHNIC RESEARCH & DEVELOPMENT CO., INC.**, 202 Tillary St., Brooklyn 1, N. Y. ADV. PG. 56, 57.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
(V)**SPERRY GYROSCOPE CO.**, Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.

DETECTORS—*Null*

(V)**BARKER & WILLIAMSON**, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
(V)**BROWN ELECTRO-MEASUREMENT CORP.**, 4637 SE Hawthorne Blvd., Portland 15, Ore. ADV. PG. 276.
(V)**FREED TRANSFORMER CO., INC.**, 1736 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 143.
(V)**GENERAL RADIO CO.**, 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
(V)**HARVEY RADIO LABS.**, 447 Concord Ave., Cambridge, Mass. ADV. PG. 104.
(V)**HEWLETT-PACKARD CO.**, 395 Page Mill Rd., Palo Alto, Calif. ADV. PG. 68, 69.
(V)Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
(V)**MACDONALD CO., INC.**, W. S., 33 University Rd., Cambridge 38, Mass. ADV. PG. 218.
(V)Marconi Instruments Ltd., 23 Beaver St., New York 1, N. Y.
(V)Rubicon Co., 3751 Ridge Ave., Philadelphia, Pa.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
(V)Technology Instrument Corp., 1058 Main St., Waltham 54, Mass.

DETECTORS, RADIATION

(V)Anton Electronic Laboratories, Inc., 1226-1238 Flushing Ave., Brooklyn 6, N. Y.
(V)Applied Physics Corp., 30 W. Green St., Pasadena 1, Calif.
(V)Atlas Coil Winders, Inc., Stamford, Conn.
(V)**ATOMIC INSTRUMENT CO.**, 160 Charles St., Boston, Mass. ADV. PG. 218.
(V)Clarkstan Corp., 11927 S. W. Pico Blvd., Los Angeles 64, Calif.
Electronic Products Co., 111 E. 3rd St., Mt. Vernon, N. Y.
(V)**EL-TRONICS, INC.**, 2649 N. Howard St., Philadelphia 33, Pa. ADV. PG. 238.
(V)Fisher Research Lab., 1961 University Ave., Palo Alto, Calif.
(V)**FLADER, INC.**, Frederic, North Tonawanda, N. Y. ADV. PG. 240.
(V)Forty Niner Co., 5245 Grand River, Detroit 8, Mich.
(V)**GENERAL RADIO CO.**, 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Harshaw Scientific Div. of The Harshaw Chemical Co., 1945 E. 97th St., Cleveland 6, Ohio.
(V)Kelley-Koett Mfg. Co., Instrument Div., 12 E. 6th St., Covington, Ky.
(V)**MACDONALD CO., INC.**, W. S., 33 University Rd., Cambridge 38, Mass. ADV. PG. 218.
(V)Manufacturers Engr. & Equip. Corp., Willow Grove, Pa.
(V)**MEASUREMENTS CORP.**, Bounton, N. J. ADV. PG. 145.
(V)National Technical Laboratories, 820 Mission St., South Pasadena, Calif.
(V)North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
(V)Nuclear Development Lab., P. O. Box 7034, Kansas City, Mo.
(V)Nuclear Instrument & Chemical Corp., 223 W. Erie St., Chicago 10, Ill.
(V)Nucleonic Corp. of America, The, 497 Union St., Brooklyn 31, N. Y.
(V)Perkin-Elmer Corp., The, Glenbrook, Conn.
(V)Radiation Counter Laboratories, Inc., 1844 W. 21st St., Chicago 8, Ill.
(V)**RADIO CORP. OF AMERICA**, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
(V)Radioactive Products, Inc., 3201 E. Woodbridge St., Detroit 7, Mich.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
(V)Special Instruments Laboratory, Inc., 1003 Highland Ave., Knoxville, Tenn.
(V)Standard Electronics Research Corp., 2 East End Ave., New York 21, N. Y.
(V)Technical Associates, 3730 San Fernando Rd., Glendale 4, Calif.
(V)Tracerlab Inc., 130 High St., Boston 10, Mass.
Z & W Machine Products Inc., Electronics Div., 5151 St. Clair Ave., Cleveland 3, Ohio.

DETECTORS—*r-f Null*

(V)Kalbfell Labs., Inc., 1076 Morena Blvd., San Diego 10, Calif.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.

DETECTORS—*Reactance*

(V)**GENERAL ELECTRIC CO.**, Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
(V)**GENERAL RADIO CO.**, 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.

DETECTORS—*Vibration*

(V)**AIRCRAFT ELECTRONICS ASSOCIATES, INC.**, 1031 New Britain Ave., Hartford 10, Conn. ADV. PG. 214.
(V)Consolidated Engineering Corp., 620 N. Lake Ave., Pasadena 4, Calif.
FLADER, INC., FREDERIC, North Tonawanda, N. Y. ADV. PG. 240.
(V)**GENERAL RADIO CO.**, 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
(V)Hathaway Instrument Co., 1315 S. Clarkson St., Denver 10, Colo.
(V)**KAY ELECTRIC CO.**, 14 Maple Ave., Pine Brook, N. J. ADV. PG. 193.
(V)North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ Southwestern Industrial Electronic Co., 2811 Post Oak Rd., Houston 19, Texas
Ⓥ SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.

DETECTORS—*Water Leak*

Fisher Research Lab., 1961 University Ave., Palo Alto, Calif.
Lunenite Electric Co., 407 S. Dearborn St., Chicago, Ill.
Ⓥ Nilson Electrical Laboratory, Inc., 103 Lafayette St., New York 13, N. Y.

DIAL CRYSTALS

Austin Co., O., 335 Throop Ave., Brooklyn 21, N. Y.
Ⓥ Cleveland Co., Inc., The, 1239 Central Ave., Hillside 5, N. J.
Felsenthal & Sons, Inc., G., 4100 W. Grand Ave., Chicago 51, Ill.
Ⓥ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
Ⓥ Parrish Novelty Co., 3510 South Western Ave., Chicago 9, Ill.
Plastic Accessories, Inc., 93 Mercer St., New York 12, N. Y.
Potomac Inc., 95 Mercer St., New York, N. Y.
Ⓥ Schlecker Miller Co., 10 Parker Ave. W., So. Orange, N. J.

DIALS—*Instrument*

Ⓥ Acromark Co., The, 442 Morrell St., Elizabeth 4, N. J.
Addresser Corp., 104 Brookline Ave., Boston, Mass.
Ⓥ Bowen & Co., Inc., 4712 Bethesda Ave., Bethesda, Md.
Austin Co., O., 335 Throop Ave., Brooklyn 21, N. Y.
Ⓥ Bud Radio, Inc., 2118 E. 55th St., Cleveland 3, Ohio
Ⓥ Dumont & Co., J. P., 81 Prospect St., Brooklyn, N. Y.
Ⓥ CINEMA ENGINEERING CO., 1510 W. Verdugo Ave., Burbank, Calif. ADV. PG. 186.
Ⓥ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ Consolidated Molded Products Corp., Scranton 2, Pa.
Ⓥ Croname, Inc., 3701 Ravenswood Ave., Chicago, Ill.
Ⓥ Cleveland Co., Inc., The, 1239 Central Ave., Hillside 5, N. J.
Ⓥ Etched Products Corp., 39-01 Queens Blvd., Long Island City, N. Y.
Felsenthal & Sons, Inc., G., 4100 W. Grand Ave., Chicago 51, Ill.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Ⓥ GIBBS DIVISION GEORGE W. BORG CORP., Delavan, Wis. ADV. PG. 198, 199.
Gits Molding Corp., 4600 W. Huron St., Chicago 44, Ill.
Ⓥ Grammes & Sons, Inc., L. F., 389 Union St., Allentown 2, Pa.
Ⓥ HELIPOT CO., 916 Meridian Ave., So. Pasadena, Calif. ADV. PG. 103.
Ⓥ Hopp Press, Inc., 460 W. 34th St., New York, N. Y.
Ⓥ Instrument Laboratories, 315 W. Walton Place, Chicago 10, Ill.
Ⓥ INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
Ⓥ Lamicoid Fabricators, Inc., 4545 Cortland St., Chicago 39, Ill.
Ⓥ MICA INSULATOR CO., Schenectady 5, N. Y. ADV. PG. 242.
Ⓥ Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.
Ⓥ Molded Insulation Co., Aircraft Control Div., 335 E. Price St., Philadelphia, Pa.
Ⓥ Optical Film Engineering Co., 2225 Cherry St., Philadelphia 3, Pa.
Ⓥ Parrish Novelty Co., 3510 S. Western Ave., Chicago 9, Ill.
Plastic Accessories, Inc., 93 Mercer St., New York 12, N. Y.
Plastic Fabricators Co., 440 Sansome St., San Francisco 11, Calif.
Ⓥ Precoat Metal Etching Co., 21-03 44th Ave., Long Island City, N. Y.
Prestole Inc., 95 Mercer St., New York, N. Y.
Ⓥ Schlecker Miller Co., 10 Parker Ave. W., So. Orange, N. J.
Ⓥ Shaw Engineering & Mfg. Co., 5970 S. Grand Ave., Los Angeles 27, Calif.
Sun Dial Corp., E. Passaic Ave., Caldwell Township, N. J.
Ⓥ Tablet & Ticket Co., 1021 W. Adams St., Chicago 7, Ill.
Technicraft Supply Co., Radiocrafters, 1154 Commonwealth Ave., Boston 34, Mass.
Ⓥ Technology Instrument Corp., 1058 Main St., Waltham 54, Mass.
Ⓥ U. S. Gauge Div., American Machine & Metals, Inc., Sellersville, Pa.
Ⓥ U. S. Radium Corp., 535 Pearl St., New York 7, N. Y.
Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

DIALS—*Precision*

Ⓥ Acromark Co., The, 442 Morrell St., Elizabeth 4, N. J.
Addresser Corp., 104 Brookline Ave., Boston, Mass.
Austin Co., O., 335 Throop Ave., Brooklyn 21, N. Y.
Ⓥ Baldwin Locomotive Works, Philadelphia 42, Pa.
Ⓥ Bowen & Co., Inc., 4712 Bethesda Ave., Bethesda, Md.
Ⓥ CINEMA ENGINEERING CO., 1510 W. Verdugo Ave., Burbank, Calif. ADV. PG. 186.
Ⓥ Citation Products Co., 233 E. 146th St., New York 51, N. Y.
Ⓥ Croname, Inc., 3701 Ravenswood Ave., Chicago, Ill.
Felsenthal & Sons, Inc., G., 4100 W. Grand Ave., Chicago 51, Ill.
Ⓥ Guertler Scientific Corp., 1201 Wrightwood Ave., Chicago 14, Ill.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Gits Molding Corp., 4600 W. Huron St., Chicago 44, Ill.
Ⓥ HELIPOT CORP., 916 Meridian Ave., So. Pasadena, Calif. ADV. PG. 103.
Ⓥ Instrument Laboratories, 315 W. Walton Place, Chicago 10, Ill.
Ⓥ Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.
Ⓥ Molded Insulation Co., Aircraft Control Div., 335 E. Price St., Philadelphia, Pa.
Ⓥ NATIONAL CO., INC., 61 Sherman St., Malden 48, Mass. ADV. PG. 35 to 36.
Plastic Accessories, Inc., 93 Mercer St., New York 12, N. Y.
Potomac Inc., 95 Mercer St., New York, N. Y.
Ⓥ Stolle Engineering & Mfg. Co., 5970 S. Grand Ave., Los Angeles 27, Calif.
Sun Dial Corp., E. Passaic Ave., Caldwell Township, N. J.
Ⓥ Tablet & Ticket Co., 1021 W. Adams St., Chicago 7, Ill.
Ⓥ U. S. Gauge Div., American Machine & Metals, Inc., Sellersville, Pa.
Ⓥ U. S. Radium Corp., 535 Pearl St., New York 7, N. Y.

DIAPHRAGMS

Ⓥ Cook Electric Co., 2700 Southport Ave., Chicago 14, Ill.
Ⓥ Hawley Products Co., St. Charles, Ill.
Ⓥ LORD MFG. CO., 1635 W. 12th St., Erie, Pa. ADV. PG. 55.
Ⓥ Raion Electric Co., 52 E. 19th St., New York 3, N. Y.
Ⓥ Stevens Products Inc., 86-88 Main St., East Orange, N. J.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

DIATHERMY

Ⓥ American Diathermy Productions, 11240 W. Olympic Blvd., Los Angeles 25, Calif.
Ⓥ Butcher Corp., 5087 Huntington Dr., Los Angeles 32, Calif.
Ⓥ Branston Electric Mfg. Co., Inc., 62-65 Gill Pl., Buffalo 22, N. Y.
Dalton Labs., 5046 Santa Monica Blvd., Los Angeles, Calif.
Ⓥ General Electric X-Ray Corp., 4855 W. McGeoch Ave., Milwaukee, Wis.
Ⓥ Leyel High Frequency Labs., Inc., 39 W. 60th St., New York 23, N. Y.
Ⓥ Liebel-Flarsheim Co., 303 W. Third St., Cincinnati 2, Ohio.
Ⓥ Marconi Instruments, Ltd., 23 Beaver St., New York 4, N. Y.
Ⓥ Mooradian High Frequency Labs., 13 E. Fort Lee Rd., Bogota, N. J.
Ⓥ RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ Wappler, Inc., 27 W. 24th St., New York 10, N. Y.

DIATHERMY ACCESSORIES

Ⓥ American Diathermy Productions, 11240 W. Olympic Blvd., Los Angeles 25, Calif.
Ⓥ Andrew Corp., 363 E. 75th St., Chicago 19, Ill.
Bunbach Radio Co., Inc., 145 Hudson St., New York, N. Y.
Ⓥ Butcher Corp., 5087 Huntington Dr., Los Angeles 32, Calif.
Ⓥ Branston Electric Mfg. Co., Inc., 62-65 Gill Pl., Buffalo 22, N. Y.
Dalton Labs., 5046 Santa Monica Blvd., Los Angeles, Calif.
Ⓥ General Electric X-Ray Corp., 4855 W. McGeoch Ave., Milwaukee, Wis.
Ⓥ General R-F Fittings Co., 126 Dartmouth St., Boston 16, Mass.
Ⓥ Leyel High Frequency Labs., Inc., 39 W. 60th St., New York 23, N. Y.
Ⓥ Liebel-Flarsheim Co., 303 W. Third St., Cincinnati 2, Ohio.
Ⓥ Marconi Instruments, Ltd., 23 Beaver St., New York 4, N. Y.
Ⓥ Mooradian High Frequency Labs., 13 E. Fort Lee Rd., Bogota, N. J.
Ⓥ RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
Ⓥ Wappler, Inc., 27 W. 24th St., New York 10, N. Y.

DIELECTRIC HEATING

See Heating, Dielectric

DIELECTRICS—*Liquids & Solids*

Ⓥ Bakelite Div., Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y.
Ⓥ CENTRALAB DIV. OF GLOBE UNION INC., 900 E. Keefe Ave., Milwaukee, Wis. ADV. PG. 63, 65.
Ⓥ Dielectric Materials Co., 5315-17 N. Ravenswood Ave., Chicago 40, Ill.
Ⓥ Dow Chemical Co., Midland, Mich.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ GENERAL ELECTRIC CO., Chemical Dept., Pittsfield, Mass. ADV. PG. 5 to 18.
Ⓥ Halowax Products Division, Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y.
Ⓥ Lukie Incorporated, P. O. Box 57, Baltimore 3, Md.

DIES

Ⓥ Akelin Stamping Co., 1923 Nebraska Ave., Toledo 7, Ohio.
Ⓥ Acromark Co., The, 442 Morrell St., Elizabeth 4, N. J.
Ⓥ ART-LLOYD METAL PRODUCTS CORP., 2973 Cropsey Ave., Brooklyn 14, N. Y. ADV. PG. 272.
Ⓥ Aikania Regulator Co., 240 E. Ontario St., Chicago 11, Ill.
Ⓥ Barrett Bindery Co., 1332 W. Monroe St., Chicago 7, Ill.
Ⓥ Carboloy Company, Inc., 11139 E. Eight Mile Blvd., Detroit 32, Mich.
Ⓥ Eastern Specialty Co., Philadelphia 40, Pa.
Electronic Mechanics, Inc., 70 Clifton Blvd., Clifton, N. J.
Felsenthal & Sons, Inc., G., 4100 W. Grand Ave., Chicago 51, Ill.
Ⓥ Fort Products Mfg. Co., 1504 W. Carroll Ave., Chicago 7, Ill.
Ⓥ Greene Mfg. Corp., G. G., Warren, Pa.
Ⓥ Hovis Screwlock Co., 8100 E. Nine Mile Rd., Van Dyke, Mich.
Ⓥ Industrial Precision Products Co., 315-325 N. Hoyne Ave., Chicago 12, Ill.
Ⓥ INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
La Pilaga Mfg. Co., Inc., East Rutherford, N. J.
Ⓥ Mjaycraft Products, Inc., 701 McCarter Highway, Newark 5, N. J.
Ⓥ Morris Co., J. T., 394 Elm St., Southbridge, Mass.
Ⓥ NATIONAL CO., INC., 61 Sherman St., Malden 48, Mass. ADV. PG. 35 to 36.
Ⓥ National Lead Co., 111 Broadway, New York 6, N. Y.
Ⓥ North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
Ⓥ Oak Ridge Products Mfg. Div. of Video Television, Inc., 239 E. 127th St., New York 35, N. Y.
Ⓥ Nell Irwin Mfg. Co., 31b 8th Ave., Lake City, Minn.
Ⓥ Pratt & Whitney Div., Niles-Bement-Pond Co., West Hartford 1, Conn.
Ⓥ Progressive Welder Co., 3050 E. Outer Drive, Detroit, Mich.
Ⓥ Remler Co., Ltd., 2101 Bryant St., San Francisco 10, Calif.
Ⓥ Repath Co., Paul R., 641 E. 61st St., Los Angeles 1, Calif.
Sperman Metal Specialties, 27 Columbia Place, Brooklyn 2, N. Y.
Ⓥ United Shoe Machinery Corp., 142 Federal St., Boston, Mass.
Ⓥ Walter Co., Inc., S., 1400 Atlantic Ave., Brooklyn 16, N. Y.
Ⓥ Whistler & Sons, Inc., S. B., 252 Military Rd., Buffalo 17, N. Y.
Ⓥ Wrought Washer Mfg. Co., 2264 S. Bay St., Milwaukee 7, Wis.

DILATOMETERS—*Automatic Recording*

Ⓥ Bristol Co., The, Waterbury 20, Conn.
Ⓥ SYLVANIA ELECTRIC PRODUCTS, INC., Emporium, Pa. ADV. PG. 286 to 290.

DIRECTION FINDERS

Ⓥ Air Associates, Inc., Teterboro, N. J.
American Electroneering Co., 2122 S. LaBrea Ave., Los Angeles, Calif.
Ⓥ Applied Electronics Co., 1246 Folsom St., San Francisco 3, Calif.
Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 164.
Ⓥ Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

Ⓥ Fairchild Camera & Instrument Corp., 88-06 Van Wyck Blvd., Jamaica 1, N. Y.
Ⓥ Federal Telecommunication Labs., Inc., 500 Washington Ave., Nutley 10, N. J.
Ⓥ FEDERAL TELEPHONE & RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.
Fisher Research Lab., 1961 University Ave., Palo Alto, Calif.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Intervox Corp., 2701 California Ave., Seattle 6, Wash.
Jarvis Electronics Corp., 6058 Fullerton Ave., Chicago 39, Ill.
Ⓥ Kaar Engineering Co., 2995 Middlefield Rd., Palo Alto, Calif.
Ⓥ Lear, Inc., 110 Ionia Ave., N. W., Grand Rapids 2, Mich.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 74 to 75. Inside Back and Back Covers.
Ⓥ Radiomarine Corp. of America, 75 Varick St., New York 13, N. Y.
Ⓥ SERVO CORP. OF AMERICA, 2020 Jericho Turnpike, New Hyde Park, N. Y. ADV. PG. 269.
Smuckler & Co., Inc., A. F., 202 Tillary St., Brooklyn 1, N. Y.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ Submarine Signal Div., Raytheon Mfg. Co., Waltham, Mass.

DISCS—*Blank Recording*

Ⓥ Advance Recording Products Co., 36-12 34th St., L. I. City, N. Y.
Ⓥ Am Industries, 41 Union Square, New York 3, N. Y.
Ⓥ Allied Recording Products Co., 21-09 43rd Ave., Long Island City 1, N. Y.
Ⓥ AUDIO DEVICES, INC., 444 Madison Ave., New York 22, N. Y. ADV. PG. 37.
Ⓥ Home Recording Products Corp., Freeport, L. I., N. Y.
Mirror Record Corp., 1133 Broadway, New York 10, N. Y.
Ⓥ PRESTO RECORDING CORP., Paramus, N. J. ADV. PG. 94, 95.
Ⓥ Recordisc Corp., 395 Broadway, New York, N. Y.
Ⓥ Reeves Corp., 241 Fourth Ave., New York 10, N. Y.
Ⓥ REEVES SOUNDCRAFT CORP., 35-54 36th St., Long Island City, N. Y. ADV. PG. 171.
Ⓥ Sonic Recording Products, Inc., 58 Mill Road, Freeport, N. Y.
Ⓥ Soundscriber Corp., 146 Munson St., New Haven 4, Conn.
Ⓥ Wilcox-Gay Corp., Charlotte, Michigan.

DRAFTING EQUIPMENT

Ⓥ Brunings Co., Inc., Charles, 4754 Montrose Ave., Chicago 41, Ill.
Ⓥ Dietzgen Co., Eugene, 2425 Sheffield Ave., Chicago, Ill.
Ⓥ Dixon Crucible Co., Joseph, Jersey City, N. J.
Ⓥ Eagle Pencil Co., 703 East 13th St., New York, N. Y.
Ⓥ Eberhard Faber Pencil Co., 37 Greenpoint Ave., Brooklyn 22, N. Y.
Ⓥ Keuffel & Esser Co., Hoboken, N. J.
Ⓥ Post Co., Frederick, 3650 N. Avondale Ave., P. O. Box 804, Chicago 90, Ill.
Ⓥ Universal Drafting Machine Corp., 2960 Lorain Ave., Cleveland 2, Ohio.
Weber Co., F., 1220 Buttonwood St., Philadelphia 23, Pa.
Weil & Co., J. H., 1315 Cherry St., Philadelphia 7, Pa.

DRIVERS—*Recording*

Ⓥ CRAMER CO., INC., R. W., Box 13, Centerbrook, Conn. ADV. PG. 209.
Ⓥ EASTERN AIR DEVICES, INC., 585 Dean St., Brooklyn 17, N. Y. ADV. PG. 258.
Ⓥ Fairchild Recording Equipment Corp., 154th St. & 7th Avenue, Whitestone, N. Y.
Ⓥ Gates Radio Co., Quincy, Ill.
Ⓥ Lear, Inc., 110 Ionia Ave., N.W., Grand Rapids 2, Mich.
Ⓥ Press Wireless Mfg. Co., Inc., Cantiague Rd., Hicksville, L. I., N. Y.
Ⓥ Stancil-Hoffman Corp., 1016 N. Highland Ave., Hollywood 38, Calif.

DRIVES—*Small Electric Drive Mechanisms*

Ⓥ Air Associates, Inc., Teterboro, N. J.
Ⓥ ALDEN PRODUCTS CO., 117 No. Main St., Brockton 64, Mass. ADV. PG. 235.
Barber Coleman Co., Rockford, Ill.
Bonell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ Cannon Mfg. Co., 416 E. Aberdeen St., Chicago, Ill.
Ⓥ CRAMER CO., INC., R. W., Box 13, Centerbrook, Conn. ADV. PG. 209.
Ⓥ EASTERN AIR DEVICES, INC., 585 Dean St., Brooklyn 17, N. Y. ADV. PG. 258.
Ⓥ ELECTRIC INDICATOR CO., 21 Parker Ave., Stamford, Conn. ADV. PG. 160.
Ⓥ Gair Dorothea Mechanisms, 37-61 85th St., Jackson Heights, L. I., N. Y.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Gleason-Avery Inc., Auburn, N. Y.
Ⓥ Gorrell & Gorrell, Haworth, N. J.
Ⓥ HAYDON CO., A. W., THE, 232 N. Elm St., Waterbury, Conn. ADV. PG. 236.
Ⓥ Lear, Inc., 110 Ionia Ave., N. W., Grand Rapids 2, Mich.
Ⓥ McElroy Mfg. Corp., Littleton, N. J.
Ⓥ Manufacturers Thread Grinding Inc., P. O. Box 66, Eatontown, N. J.
Ⓥ SERVO CORP. OF AMERICA, 2020 Jericho Turnpike, New Hyde Park, N. Y. ADV. PG. 269.
Ⓥ Servomechanisms, Inc., 142 Mineola Blvd., Mineola, N. Y.
Ⓥ SERVO-TEK PRODUCTS CO., 4 Godwin Ave., Paterson 1, N. J. ADV. PG. 187.
Ⓥ Stancil-Hoffman Corp., 1016 N. Highland Ave., Hollywood 38, Calif.
VECTRON, INC., 235 High St., Waltham, Mass. ADV. PG. 266.

DRYERS, ELECTRONIC—*Dehydration and Drying*

Ⓥ Bowser, Inc., Refrigeration Div., Terryville, Conn.
Ⓥ Electronic Engineering Corp., 624 Ridge Rd., Lyndhurst, N. J.
Ⓥ RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
Ⓥ Sherman Industrial Electronics Co., 505 Washington Ave., Belleville 9, N. J.

DYNAMOMETERS

Ⓥ Dillon & Co., Inc., W. C., 5410 W. Harrison St., Chicago 44, Ill.
Ⓥ Electric Products Co., 1725 Clarkstone Rd., Cleveland 12, Ohio.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
Ⓥ L. A. B. Corp., 31 Union Place, Summit, N. J.
Ⓥ Lear, Inc., 110 Ionia Ave., N. W., Grand Rapids 2, Mich.
Ⓥ Sensitive Research Instrument Corp., 9 Elm Ave., Mt. Vernon, N. Y.
Ⓥ Statham Laboratories, Inc., 9328 Santa Monica Blvd., Beverly Hills, Calif.

DYNAMOTORS

See Generators, Motor

ELECTRO MAGNETS

See Magnets

ELECTROCARDIOGRAPHS

Ⓥ Cossor (Canada) Ltd., 301-303 Windsor St., Halifax, N. S., Canada.
Ⓥ Edin Electronics Co., 207 Main St., Worcester, Mass.
Ⓥ Electrofax Corp., 30 Burtis Ave., New Canaan, Conn.
Ⓥ General Electric X-Ray Corp., 4855 W. McGeoch Ave., Milwaukee, Wis.
Ⓥ Hathaway Instrument Co., 1315 S. Clarkson St., Denver 10, Colo.
Ⓥ SANBORN CO., 39 Osborn St., Cambridge 39, Mass. ADV. PG. 219.
Ⓥ Tech Laboratories, Inc., Bergen & Edsall Blvds., Palisades Park, N. J.
Z & W Machine Products Inc., Electronics Div., 5151 St. Clair Ave., Cleveland 3, Ohio.

ELECTRODES—*High Frequency*

Ⓥ Electronic Engineering Corp., 624 Ridge Rd., Lyndhurst, N. J.
Electronic Equipment & Instrument Co., Inc., 23 S. Arch St., Philadelphia 3, Pa.
Ⓥ Electronic Processes Corp., 260 N. First St., San Jose 18, Calif.
Ⓥ Elsted Products Corp., 39-01 Queens Blvd., Long Island City, N. Y.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Pan-American Electronics, Inc., 5816 S. Santa Fe Ave., Los Angeles 11, Calif.
Ⓥ RAYTHEON MFG. CO., Power Tube Div., Waltham 54, Mass. ADV. PG. 257.
Ⓥ Sherman Industrial Electronics Co., 505 Washington Ave., Belleville 9, N. J.
Ⓥ STACKPOLE CARBON CO., St. Marys, Pa. ADV. PG. 166, 167.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Woodwelding, Inc., 3000 W. Olive Ave., Burbank, Calif.

ELECTRODYNAMOMETERS

Ⓥ Gale Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ RAWSON ELECTRICAL INSTRUMENT CO., 111 Potter St., Cambridge 42, Mass. ADV. PG. 156.
Ⓥ Sensitive Research Instrument Corp., 9 Elm Ave., Mt. Vernon, N. Y.
Ⓥ Triplett Electrical Instrument Co., 286 Harmon Road, Bluffton, Ohio.
Ⓥ Welch Scientific Co., W. M., 1515 Sedgwick St., Chicago 10, Ill.

ELECTROENCEPHALOGRAPHS

Ⓥ Edin Electronics Co., 207 Main St., Worcester, Mass.
Ⓥ Electro-Medical Lab., Inc., Holliston, Mass.
Ⓥ Grass Instrument Co., 101 Old Colony Ave., Quincy, Mass.
Ⓥ Marconi Instruments, Ltd., 23 Beaver St., New York 4, N. Y.
Ⓥ Offner Electronics, Inc., 5320 N. Kedzie Ave., Chicago 25, Ill.
Ⓥ RAHM INSTRUMENTS, INC., 12 W. Broadway, New York 7, N. Y. ADV. PG. 178.

ELECTROMYOGRAPHS

Ⓥ Edin Electronics Co., 207 Main St., Worcester, Mass.
Ⓥ Electro-Medical Lab., Inc., Holliston, Mass.
Ⓥ Grass Instrument Co., 101 Old Colony Ave., Quincy, Mass.
Ⓥ LAVOIE LABORATORIES, Morganville, N. J. ADV. PG. 151.
Process & Instruments, 60 Greenpoint Ave., Brooklyn 22, N. Y.
Ⓥ RAHM INSTRUMENTS, INC., 12 W. Broadway, New York 7, N. Y. ADV. PG. 178.

ELECTROPLETHYSMOGRAPHS

Process & Instruments, 60 Greenpoint Ave., Brooklyn 22, N. Y.
Ⓥ RAHM INSTRUMENTS, INC., 12 W. Broadway, New York 7, N. Y. ADV. PG. 178.
Ⓥ SANBORN CO., 39 Osborn St., Cambridge 39, Mass. ADV. PG. 219.

ELECTRO-SHOCK THERAPY APPARATUS

Aerolux Light Corp., 653 11th Ave., New York 19, N. Y.
Electronic Equipment & Instrument Co., Inc., 23 S. Arch St., Philadelphia 3, Pa.
Ⓥ Elektra Laboratories, 30 E. 10th St., New York 3, N. Y.
Ⓥ Offner Electronics, Inc., 5320 N. Kedzie Ave., Chicago 25, Ill.
Ⓥ RAHM INSTRUMENTS, INC., 12 W. Broadway, New York 7, N. Y. ADV. PG. 178.

ELECTRO-SURGICAL APPARATUS

Ⓥ Baldwin Locomotive Works, Philadelphia 42, Pa.
Ⓥ Bitcher Corp., 5087 Huntington Dr., Los Angeles 32, Calif.
Ⓥ Bronson Electric Mfg. Co., Inc., 62-65 Gill Pl., Buffalo 22, N. Y.
Dallons Labs., 5066 Santa Monica Blvd., Los Angeles, Calif.
Electronic Equipment & Instrument Co., Inc., 23 Arch St., Philadelphia 3, Pa.
Ⓥ Liebel-Flarsheim Co., 303 W. Third St., Cincinnati 2, Ohio.
Ⓥ Marconi Instruments, Ltd., 23 Beaver St., New York 4, N. Y.
Ⓥ Maxadian High Frequency Labs., 13 E. Fort Lee Rd., Bogota, N. J.
Ⓥ RAYTHEON MFG. CO., Power Tube Div., Waltham 54, Mass. ADV. PG. 257.
Ⓥ Statham Laboratories, Inc., 9328 Santa Monica Blvd., Beverly Hills, Calif.
Ⓥ Wappler, Inc., 27 W. 24th St., New York 10, N. Y.

ELEMENTS, HEATING—*Crystal Oven*

Ⓥ Atlas Electric Products Co., P. O. Box 1591, Erie, Pa.
Eagle Electric Mfg. Co., Inc., 23-10 Bridge Plaza S., Long Island City, N. Y.
Monitor Products Co., 815 Fremont St., So. Pasadena, Calif.
Ⓥ Premier Crystal Labs., Inc., 79-89 Seventh Ave., New York 11, N. Y.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ VULCAN ELECTRIC CO., 88 Holten St., Danvers, Mass. ADV. PG. 226.

ESCUTCHEONS

Ⓥ Allmetal Screw Products Co., Inc., 33 Greene St., New York 13, N. Y.
Ⓥ American Emblem Co., P. O. Box 116 R, Utica, N. Y.
Austin Co., O., 335 Throop Ave., Brooklyn 21, N. Y.
Ⓥ Catalin Corp. of America, 1 Park Ave., New York 16, N. Y.
Ⓥ CINEMA ENGINEERING CO., 1510 W. Verdugo Ave., Burbank, Calif. ADV. PG. 186.
Ⓥ Croname, Inc., 3701 Ravenswood Ave., Chicago, Ill.
Ⓥ Delco Radio Div., General Motors Corp., Kokomo, Ind.
Gemloid Corp., 79-10 Albion Ave., Elmhurst, N. Y.

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

Gits Molding Corp., 4600 W. Huron St., Chicago 44, Ill.
Ⓥ Grammes & Sons, Inc., L. F., 389 Union St., Allentown 2, Pa.
Ⓥ Haberland Mfg. Co., P. O. Box 476, Passaic, N. J.
Kling Metal Spinning Co., 174 Centre St., New York 13, N. Y.
Ⓥ Parisian Novelty Co., 3510 South Western Ave., Chicago 9, Ill.
Plastic Accessories, Inc., 93 Mercer St., New York 12, N. Y.
Ⓥ Plastimold Corp., Attleboro, Mass.
Prestole Corp., 3119 Bellevue Rd., Toledo 6, Ohio.
Ⓥ Stronghold Screw Products Inc., 216-222 W. Hubbard St., Chicago 10, Ill.
Syracuse Ornamental Co., 581 So. Clinton St., Syracuse, N. Y.
Ⓥ Waterbury Companies, Inc., Waterbury 90, Conn.

EYELETS

Ⓥ Atlas Tack Corp., Pleasant St., Fairhaven, Mass.
Ⓥ Barrett Bindery Co., 1432 W. Monroe St., Chicago 7, Ill.
Corby Mfg. Co., Inc., 62 Cottage Place, Waterbury 5, Conn.
Ⓥ FEDERAL SCREW PRODUCTS INC., 224 W. Huron St., Chicago 10, Ill. ADV. PG. 222.
Ⓥ INSULINE CORP. OF AMERICA, 34-02 36th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
Ⓥ Judd Co., H. L., 87 Chambers St., New York 7, N. Y.
Ⓥ Kirkill Mfg. Co., Industrial Fastener Div., Waterbury, Conn.
Simpson Co., Inc., Edwin B., 74 Franklin Ave., Brooklyn 5, N. Y.
Ⓥ United Carr Fastener Corp., Cambridge 42, Mass.
Ⓥ United Shoe Machinery Corp., 140 Federal St., Boston, Mass.
Ⓥ Waterbury Companies, Inc., Waterbury 90, Conn.

FABRIC

See Insulation Materials

FACSIMILE

See Recorders, Facsimile

FACSIMILE RECORDING PAPERS

See Papers, Facsimile Recording

FANS—*Tube Cooling*

Ⓥ Automatic Signal Division, 100 Regent St., East Norwalk, Conn.
Ⓥ Barber Colman Co., Rockford, Ill.
Ⓥ Dynamic Air Engineering Inc., 1419 S. Alameda St., Los Angeles, Calif.
Ⓥ EASTERN AIR DEVICES, INC., 585 Dean St., Brooklyn 17, N. Y. ADV. PG. 256.
Ⓥ Fairchild Camera & Instrument Corp., 88-06 Van Wyck Blvd., Jamaica 1, N. Y.
Ⓥ Fasco Industries, Inc., Rochester 2, N. Y.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 9 to 16.
Ⓥ Ilg Electric Ventilating Co., 2850 N. Crawford Ave., Chicago 41, Ill.
Ripley Co., Inc., P. O. Box 31, Middletown, Conn.
Ⓥ ROTRON MFG. CO., INC., 7-9 Schoonmaker Lane, Woodstock, N. Y. ADV. PG. 240.
Ⓥ Small Motors, Inc., 2076 Elston Ave., Chicago 14, Ill.

FASTENERS & FASTENING DEVICES

Ⓥ ALLEN MFG. CO., Hartford, Conn. ADV. PG. 80.
Ⓥ Almond Screw Products Co., Inc., 53 Greene St., New York 13, N. Y.
Ⓥ Anderson Co., 216-222 W. 18th St., New York 6, N. Y.
Ⓥ BLAKE & JOHNSON CO., Waterville 54, Conn. ADV. PG. 223.
Ⓥ Boots Aircraft Nut Corp., 50 John St., Stamford, Conn.
Ⓥ Camloc Fastener Corp., 420 Lexington Ave., New York 17, N. Y.
Cherry Rivet Co., 231 Winston St., Los Angeles 13, Calif.
Ⓥ CINCH MFG. CORP., 1026 S. Homan Ave., Chicago 24, Ill. ADV. PG. 114.
Ⓥ Corbin Screw Div., American Hardware Corp., High, Mantle & Grove Sts., New Britain, Conn.
Ⓥ Dixon Gray Co., 207 E. Sixth St., Dayton, Ohio.
Ⓥ Elco Fastener Co., Box 785, Babylon, N. Y.
Ⓥ FEDERAL SCREW PRODUCTS, INC., 224 W. Huron St., Chicago 10, Ill. ADV. PG. 222.
Ⓥ Garrett Co., Inc., George K., D & Tioga Sts., Philadelphia 34, Pa.
Ⓥ Grammes & Sons Inc., L. F., 389 Union St., Allentown 2, Pa.
Ⓥ Greene Mfg. Corp., G. G., Warren, Pa.
Ⓥ Harper Co., The, H. M., 8200 Lehigh Ave., Morton Grove, Ill.
Ⓥ Heli-Coil Corp., 47-23 35th St., Long Island City 1, N. Y.
Ⓥ Judd Co., H. L., 87 Chambers St., New York 7, N. Y.
Ⓥ Lamson & Sessions Co., 1971 W. 85th St., Cleveland, Ohio.
Ⓥ National Screw & Mfg. Co., Cleveland 4, Ohio.
Ⓥ PALNUT CO., INC., 77 Cordier St., Irvington 11, N. J. ADV. PG. 170.
Ⓥ Parker-Kalon Corp., 200 Varick St., New York 14, N. Y.
Penn Engineering & Mfg. Corp., Box 311, Doylestown, Pa.
Ⓥ Pheoll Mfg. Co., 5700 Roosevelt Rd., Chicago 50, Ill.
Ⓥ Pilgrim Mfg. Co., 155 Chestnut St., Providence, R. I.
Prestole Corp., 3119 Bellevue Rd., Toledo 6, Ohio.
Ⓥ Production Engineering Co., 173 Sargeant Ave., Clifton, N. J.
Ⓥ Russell, Burdsall & Ward Bolt and Nut Co., Midland Ave., Port Chester, N. Y.
Ⓥ Scovill Mfg. Co., Industrial Fastener Div., Waterbury, Conn.
Ⓥ Shakeproof Inc., Div. of Illinois Tool Works, 2501 N. Keeler Ave., Chicago 39, Ill.
Ⓥ Stimpson Co., Inc., Edwin B., 74 Franklin Ave., Brooklyn 5, N. Y.
Ⓥ Stronghold Screw Products, Inc., 216-22 West Hubbard St., Chicago 10, Ill.
Tinnerman Products, Inc., 2038 Fulton Rd., Cleveland 13, Ohio.
Ⓥ United-Carr Fastener Corp., Cambridge 42, Mass.
Ⓥ United Screw & Bolt Corp., 2513 W. Cullerton St., Chicago 8, Ill.
Ⓥ United Shoe Machinery Corp., 140 Federal St., Boston, Mass.
Ⓥ Waldes Kohinoor Inc., 47-16 Auster Place, Long Island City 1, N. Y.

FELTS & FELT PARTS

Ⓥ Felters Co., The, 210 South St., Boston, Mass.
Ⓥ National Gasket & Washer Mfg. Co., Inc., 124 E. 25th St., New York 10, N. Y.
Western Felt Works, 4029 Ogden Ave., Chicago, Ill.

FERRITE CORES & SHIELDS

Ⓥ GENERAL CERAMICS & STEATITE CORP., Keasbey, N. J. ADV. PG. 219.
Ⓥ North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.

FIBRE

See Insulation Materials

FILTERS—*Antenna*

Ⓥ Aerovox Corp., 740 E. 79th St., Chicago 19, Ill.
Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ BIRD ELECTRONIC CORP., 1800 E. 38th St., Cleveland 14, Ohio. ADV. PG. 164, 165.
Ⓥ CENTRALAB DIV. OF GLOBE UNION INC., 900 E. Keefe Ave., Milwaukee, Wis. ADV. PG. 64, 65.
Coil Winders, Inc., 61 Bergen St., Brooklyn 2, N. Y.
Collins Radio Co., Cedar Rapids, Iowa.
Continental Electronics Mfg. Co., 1728 Wood St., Dallas 1, Texas.
Ⓥ Deutschman Corp., Tobe, 921 Providence Highway, Norwood, Mass.
Ⓥ ELECTRONIC TRANSFORMER CO., INC., 215 W. 25th St., New York, N. Y. ADV. PG. 116.
Ⓥ Elston Co., Inc., The, 16-25 Bell Blvd., Bayside, L. I., N. Y.
Ⓥ K. V. Transformer Co., 4414 Park Ave., New York 57, N. Y.
Ⓥ LAVOIE LABORATORIES, Morganville, N. J. ADV. PG. 151.
Ⓥ Lenkurt Engineers, Inc., 1721 Delaney St., Philadelphia 3, Pa.
Meissner Mfg. Div., Maguire Industries Inc., Mt. Carmel, Ill.
Ⓥ Orthon Corp., The, Electronic Div., 196 Albion Ave., Paterson 2, N. J.
Ⓥ Penn Wireless Mfg. Co., Inc., Cantiague Rd., Hicksville, N. Y.
Selector Industries, Inc., 401 E. 138th St., New York 54, N. Y.
Ⓥ Television Equipment Corp., 238 William St., New York, N. Y.
Ⓥ VECTRON, INC., 235 High St., Waltham, Mass. ADV. PG. 266.

FILTERS—*Band Elimination*

Ⓥ Aero Transformer Mfg. Corp., 21-20 33rd Ave., Long Island City, N. Y.
Ⓥ Allen Lanning Corp., 161 Avenue of the Americas, New York 13, N. Y.
Aero Products Co., 5330 Baltimore Ave., Philadelphia, Pa.
Ⓥ American Transformer Co., 285 Emmet St., Newark, N. J.
Ⓥ Audio Development Co., 2833 13th Ave., S., Minneapolis 7, Minn.
Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ BURNELL & CO., 45 Warburton Ave., Yonkers 2, N. Y. ADV. PG. 59.
Ⓥ CHICAGO TRANSFORMER DIV., ESSEX WIRE CORP., 1501 W. Addison St., Chicago 13, Ill. ADV. PG. 225.
Ⓥ CINEMA ENGINEERING CO., 1510 W. Verdugo Ave., Burbank, Calif. ADV. PG. 186.
Coil Winders, Inc., 61 Bergen St., Brooklyn 2, N. Y.
Ⓥ Communication Accessories Co., Box 345, 11014 St. & Hillcrest Rd., Hickman Hills, Missouri. ADV. PG. 178.
Continental Electronics Mfg. Co., 1728 Wood St., Dallas 1, Texas.
Ⓥ DeCOURSEY ENGINEERING LAB., P. O. Box 235, Los Angeles 25, Calif. ADV. PG. 254.
Ⓥ Deutschmann Corp., Tobe, 921 Providence Highway, Norwood, Mass.
Ⓥ Electron Mfg. Co., 4536 Elston Ave., Chicago 7.
Ⓥ ELECTRONIC TRANSFORMER CO., INC., 215 W. 25th St., New York, N. Y. ADV. PG. 116.
Ⓥ Electronic Workshop, Inc., 351 Bleecker St., New York 14, N. Y.
Ⓥ FERRANTI ELECTRIC, INC., 30 Rockefeller Plaza, New York 20, N. Y. ADV. PG. 81.
Ⓥ FREED TRANSFORMER CO., INC., 1716 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 141.
Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Ⓥ HIGHLAND ENGINEERING CO., 32 Holman Blvd., Hicksville, N. Y. ADV. PG. 194.
Ⓥ Hytor Co., 11423 Vanowen St., North Hollywood, Calif.
Ⓥ K. V. Transformer Corp., 4414 Park Ave., New York 57, N. Y.
Ⓥ Kalbfell Labs, Inc., 1076 Morena Blvd., San Diego 10, Calif.
Ⓥ KENYON TRANSFORMER CO., INC., 840 Barry St., New York 59, N. Y. ADV. PG. 135.
Ⓥ KROHN-HITE INSTRUMENT CO., 580 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 128.
Ⓥ Lenkurt Electric Co., Inc., San Carlos, Calif.
Ⓥ Lear, Inc., 110 Ionia Ave., N. W., Grand Rapids 2, Mich.
Ⓥ Lynch Co., F. W., 161 2nd St., San Francisco, Calif.
Ⓥ Manufacturers Engr. & Equip. Corp., Willow Grove, Pa.
Meissner Mfg. Div., Maguire Industries Inc., Mt. Carmel, Ill.
Ⓥ Miller Co., J. W., 5917 S. Main St., Los Angeles, Calif.
Ⓥ Minnesota Electronics Corp., 97 E. Fifth St., St. Paul 1, Minn.
Ⓥ Orthon Corp., The, Electronic Div., 196 Albion Ave., Paterson 2, N. J.
Ⓥ Southwestern Industrial Electronic Co., 2831 Post Oak Rd., Houston 19, Texas.
Ⓥ STANDARD TRANSFORMER CORP., Elston, Kedzie & Addison, Chicago 18, Ill. ADV. PG. 67.
Ⓥ Thordarson Electric Mfg. Div., Maguire Industries, Inc., 500 W. Huron St., Chicago 10, Ill.
Ⓥ Transformer Engineers, 389 South Arroyo Parkway, Pasadena, Calif.
Ⓥ UNITED TRANSFORMER CO., 150 Varick St., New York 13, N. Y. ADV. PG. Inside Front Cover.
Ⓥ VECTRON, INC., 235 High St., Waltham, Mass. ADV. PG. 266.

FILTERS—*Band Pass*

Aero Products Co., 5330 Baltimore Ave., Philadelphia, Pa.
Ⓥ Aero Transformer Mfg. Corp., 21-20 33rd Ave., Long Island City, N. Y.
Ⓥ Allen Lanning Corp., 161 Avenue of the Americas, New York 13, N. Y.
Ⓥ American Transformer Co., 285 Emmett St., Newark, N. J.
Ⓥ Audio Development Co., 2833 13th Ave., S., Minneapolis 7, Minn.
Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ BURNELL & CO., 45 Warburton Ave., Yonkers 2, N. Y. ADV. PG. 59.
Ⓥ CHICAGO TRANSFORMER DIV., ESSEX WIRE CORP., 1501 W. Addison St., Chicago 13, Ill. ADV. PG. 225.
Ⓥ CINEMA ENGINEERING CO., 1510 W. Verdugo Ave., Burbank, Calif. ADV. PG. 186.
Coil Winders, Inc., 61 Bergen St., Brooklyn 2, N. Y.
Ⓥ Communication Accessories Co., Box 345, 11014 St. & Hillcrest Rd., Hickman Hills, Missouri. ADV. PG. 178.
Continental Electronics Mfg. Co., 1728 Wood St., Dallas 1, Texas.
Ⓥ DeCOURSEY ENGINEERING LAB., P. O. Box 235, Los Angeles 25, Calif. ADV. PG. 254.
Ⓥ Deutschmann Corp., Tobe, 921 Providence Highway, Norwood, Mass.
Ⓥ Electron Mfg. Co., 4536 Elston Ave., Chicago 7.
Ⓥ ELECTRONIC TRANSFORMER CO., INC., 215 W. 25th St., New York, N. Y. ADV. PG. 116.
Ⓥ Electronic Workshop, Inc., 351 Bleecker St., New York 14, N. Y.
Ⓥ FERRANTI ELECTRIC, INC., 30 Rockefeller Plaza, New York 20, N. Y. ADV. PG. 81.
Ⓥ FREED TRANSFORMER CO., INC., 1716 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 141.
Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.

Gertsch Products, Inc., 11846 Mississippi Ave., Los Angeles 25, Calif.
Ⓥ**HIGHLAND ENGINEERING CO.**, 32 Holman Blvd., Hicksville, N. Y. ADV. PG. 194.
Ⓥ Hycor Co., 11423 Vanowen St., North Hollywood, Calif.
Ⓥ**INDUSTRIAL ELECTRONICS, INC.**, 2457 Woodward Ave., Detroit 1, Mich. ADV. PG. 255.
Ⓥ K-V Transformer Corp., 4414 Park Ave., New York 57, N. Y.
Ⓥ Kalbfell Labs., Inc., 1076 Morena Blvd., San Diego 10, Calif.
Ⓥ**KENYON TRANSFORMER CO., INC.**, 840 Barry St., New York 59, N. Y.
Ⓥ**KROHN-HITE INSTRUMENT CO.**, 580 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 128.
Ⓥ Lear, Inc., 110 Ionia Ave., N. W., Grand Rapids 2, Mich.
Ⓥ Lenkurt Electric Co., Inc., San Carlos, Calif.
Loral Electronics Corp., 794 E. 140th St., New York 54, N. Y.
Ⓥ Lynch Co., F. W., 151 2nd St., San Francisco, Calif.
Ⓥ Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.
Ⓥ Miller Co., J. W., 5917 S. Main St., Los Angeles, Calif.
Ⓥ Minnesota Electronics Corp., 97 E. Fifth St., St. Paul 1, Minn.
Ⓥ Orthon Corp., The, Electronic Div., 196 Albion Ave., Paterson 2, N. J.
Ⓥ Rollin Co., 2070 N. Fair Oaks Ave., Pasadena 3, Calif.
Ⓥ Southwestern Industrial Electronic Co., 2831 Post Oak Rd., Houston 19, Texas.
Ⓥ**SPENCER-KENNEDY LABS., INC.**, 186 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 256.
Ⓥ**STANDARD TRANSFORMER CORP.**, Elston, Kedzie & Addison, Chicago 18, Ill. ADV. PG. 62.
Ⓥ Thordarson Electric Mfg. Div., Maguire Industries, Inc., 500 W. Huron St., Horn St., Chicago 10, Ill.
Ⓥ Transformer Engineers, 389 South Arroyo Parkway, Pasadena, Calif.
Ⓥ**UNITED TRANSFORMER CO.**, 150 Varick St., New York 13, N. Y. ADV. PG. Inside Front Cover.
Ⓥ**UNIVERSITY LOUDSPEAKERS, INC.**, 80 S. Kensico Ave., White Plains, N. Y. ADV. PG. 231.
VECTRON, INC., 235 High St., Waltham, Mass. ADV. PG. 266.
Western Electro-Acoustic Labs., 621 S. Spring St., Los Angeles 14, Calif.

FILTERS, CRYSTAL

Ⓥ**BARKER & WILLIAMSON**, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ**BLILEY ELECTRIC CO.**, Union Station Bldg., Erie, Pa. ADV. PG. 136.
Ⓥ**BURNELL & CO.**, 45 Warburton Ave., Yonkers 2, N. Y. ADV. PG. 59.
Coil Winders, Inc., 61 Bergen St., Brooklyn 2, N. Y.
Ⓥ Crystal Research Labs., Inc., 29 Allyn St., Hartford 3, Conn.
Ⓥ**ELECTRONIC TRANSFORMER CO., INC.**, 215 W. 25th St., New York, N. Y. ADV. PG. 116.
Ⓥ**FREED TRANSFORMER CO., INC.**, 173a Weirfield St., Brooklyn 27, N. Y. ADV. PG. 143.
Ⓥ**KNIGHTS CO., JAMES**, 131 S. Wells St., Sandwich, Ill. ADV. PG. 190.
Ⓥ Kobel Lab., R. E., 1104 Lincoln Place, Brooklyn 13, N. Y.
Ⓥ Premier Crystal Labs., Inc., 79-89 Seventh Ave., New York 11, N. Y.
Ⓥ**REEVES-HOFFMAN CORP.**, 321 Cherry St., Carlisle, Pa. ADV. PG. 32.
Ⓥ Standard Crystal Co., 400 Armstrong Ave., Kansas City 7, Kans.
Ⓥ Valpey Crystals, Highland St., Holliston, Mass.
VECTRON, INC., 235 High St., Waltham, Mass. ADV. PG. 266.
Vibar Corp., 7300 Huron River Drive, Dexter, Mich.
Westline Electronics Co., 11660 Olympic Blvd., Los Angeles 25, Calif.

FILTERS—*Detonation*

Ⓥ**ELECTRONIC TRANSFORMER CO., INC.**, 215 W. 25th St., New York, N. Y. ADV. PG. 116.

FILTERS—*Electric Wave Section*

Acro Products Co., 5330 Baltimore Ave., Philadelphia, Pa.
Ⓥ Acro Transformer Mfg. Corp., 21-20 33rd Ave., Long Island City, N. Y.
Ⓥ Audio Development Co., 2833 13th Ave., S., Minneapolis 7, Minn.
Ⓥ**BARKER & WILLIAMSON**, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ**BURNELL & CO.**, 45 Warburton Ave., Yonkers 2, N. Y. ADV. PG. 59.
Ⓥ**CHICAGO TRANSFORMER DIV., ESSEX WIRE CORP.**, 3501 W. Addison St., Chicago 18, Ill. ADV. PG. 225.
Ⓥ**COMMUNICATION ACCESSORIES CO.**, Box 345, 110th St. & Hillcrest Rd., Hickman Hills, Missouri. ADV. PG. 178.
Ⓥ**DECOURSEY ENGINEERING LAB.**, P. O. Box 235, Los Angeles 25, Calif. ADV. PG. 254.
Ⓥ Deutschmann Corp., Tobe, 921 Providence Highway, Norwood, Mass.
Ⓥ**ELECTRONIC TRANSFORMER CO., INC.**, 215 W. 25th St., New York, N. Y. ADV. PG. 116.
Ⓥ**FERRANTI ELECTRIC, INC.**, 30 Rockefeller Plaza, New York 20, N. Y. ADV. PG. 81.
Ⓥ**FREED TRANSFORMER CO., INC.**, 173a Weirfield St., Brooklyn 27, N. Y. ADV. PG. 143.
Ⓥ**GENERAL RADIO CO.**, 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Ⓥ**KENYON TRANSFORMER CO., INC.**, 840 Barry St., New York 59, N. Y. ADV. PG. 135.
Ⓥ Lear, Inc., 110 Ionia Ave., N. W., Grand Rapids 2, Mich.
Ⓥ Lenkurt Electric Co., Inc., San Carlos, Calif.
Ⓥ Lynch Co., F. W., 151 2nd St., San Francisco, Calif.
Ⓥ Minnesota Electronics Corp., 97 E. Fifth St., St. Paul 1, Minn.
Ⓥ**NORTHERN RADIO CO., INC.**, 143-145 W. 22nd St., New York 11, N. Y. ADV. PG. 132, 133.
Ⓥ Racon Electric Co., 52 E. 19th St., New York 3, N. Y.
Ⓥ Southwestern Industrial Electronic Co., 2831 Post Oak Rd., Houston 19, Texas.
Ⓥ**SPENCER-KENNEDY LABS., INC.**, 186 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 256.
Ⓥ**STANDARD TRANSFORMER CORP.**, Elston, Kedzie & Addison, Chicago 18, Ill. ADV. PG. 62.
Ⓥ Thordarson Electric Mfg. Div., Maguire Industries, Inc., 500 W. Huron St., Chicago 10, Ill.
Ⓥ Transformer Engineers, 389 South Arroyo Parkway, Pasadena, Calif.
Ⓥ**UNITED TRANSFORMER CO.**, 150 Varick St., New York 13, N. Y. ADV. PG. Inside Front Cover.
VECTRON, INC., 235 High St., Waltham, Mass. ADV. PG. 266.

FILTERS—*Equalizer*

Acro Products Co., 5330 Baltimore Ave., Philadelphia, Pa.
Ⓥ Acro Transformer Mfg. Corp., 21-20 33rd Ave., Long Island City, N. Y.
Ⓥ Altec Lansing Corp., 161 Avenue of the Americas, New York 13, N. Y.
Ⓥ Astatic Corp., The, Conneaut, Ohio.
Ⓥ Audio Equipment Sales, 153 W. 33rd St., New York 1, N. Y.
Ⓥ Audio Instrument Co., 1947 Broadway, New York 23, N. Y.
Ⓥ**BARKER & WILLIAMSON**, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ**BURNELL & CO.**, 45 Warburton Ave., Yonkers 2, N. Y. ADV. PG. 59.
Ⓥ**CINEMA ENGINEERING CO.**, 1510 W. Verdugo Ave., Burbank, Calif. ADV. PG. 186.
Ⓥ Clarkstan Corp., 11927 S.W. Pico Blvd., Los Angeles 64, Calif.
Ⓥ Collins Radio Co., Cedar Rapids, Iowa.
Ⓥ**COMMUNICATION ACCESSORIES CO.**, Box 345, 110th St. & Hillcrest Rd., Hickman Hills, Missouri. ADV. PG. 178.
Ⓥ Daven Co., 191 Central Ave., Newark 4, N. J.
Ⓥ**DECOURSEY ENGINEERING LAB.**, P. O. Box 235, Los Angeles 25, Calif. ADV. PG. 254.
Ⓥ**ELECTRONIC TRANSFORMER CO., INC.**, 215 W. 25th St., New York, N. Y. ADV. PG. 116.
Ⓥ Electronic Workshop, Inc., 351 Bleecker St., New York 14, N. Y.
Ⓥ Fairchild Recording Equipment Corp., 154th St. & 7th Ave., Whitestone, N. Y.
Ⓥ**GRAY RESEARCH & DEVELOPMENT CO.**, 16 Arbor St., Hartford 1, Conn. ADV. PG. 239.
Ⓥ Hycor Co., 11423 Vanowen St., North Hollywood, Calif.
Ⓥ**FERRANTI ELECTRIC, INC.**, 30 Rockefeller Plaza, New York 20, N. Y. ADV. PG. 81.
Ⓥ**FREED TRANSFORMER CO., INC.**, 173a Weirfield St., Brooklyn 27, N. Y. ADV. PG. 143.
Ⓥ**GRAY RESEARCH & DEVELOPMENT CO.**, 16 Arbor St., Hartford 1, Conn. ADV. PG. 239.
Ⓥ Hycor Co., 11423 Vanowen St., N. Hollywood, Calif.
Ⓥ**KENYON TRANSFORMER CO., INC.**, 840 Barry St., New York 59, N. Y. ADV. PG. 135.
Ⓥ Lenkurt Electric Co., Inc., San Carlos, Calif.
Ⓥ Lynch Co., F. W., 151 2nd St., San Francisco, Calif.
Ⓥ Minnesota Electronics Corp., 97 E. Fifth St., St. Paul 1, Minn.
Northeastern Engineering, Inc., Manchester, N. H.
Ⓥ**STANDARD TRANSFORMER CORP.**, Elston, Kedzie & Addison, Chicago 18, Ill. ADV. PG. 62.
Stephens Mfg. Corp., 8538 Warner Drive, Culver City, Calif.
Ⓥ Thordarson Electric Mfg. Div., Maguire Industries, Inc., 500 W. Huron St., Chicago 10, Ill.
Ⓥ Transformer Engineers, 389 South Arroyo Parkway, Pasadena, Calif.
Ⓥ**UNITED TRANSFORMER CO.**, 150 Varick St., New York 13, N. Y. ADV. PG. Inside Front Cover.
VECTRON, INC., 235 High St., Waltham, Mass. ADV. PG. 266.

FILTERS—*Lighting (for radio towers)*

Ⓥ Andrew Corp., 363 E. 75th St., Chicago 19, Ill.
Ⓥ**BARKER & WILLIAMSON**, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ**BURNELL & CO.**, 45 Warburton Ave., Yonkers 2, N. Y. ADV. PG. 59.
Ⓥ Gates Radio Co., Quincy, Ill.
Ⓥ Johnson Co., E. F., Waseca, Minn.
Ⓥ Miller Co., J. W., 5917 S. Main St., Los Angeles, Calif.
Ⓥ**UNITED TRANSFORMER CO.**, 150 Varick St., New York 13, N. Y. ADV. PG. Inside Front Cover.

FILTERS, MICROWAVE

Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ**HEWLETT-PACKARD CO.**, 395 Page Mill Rd., Palo Alto, Calif. ADV. PG. 68, 69.
Ⓥ K-V Transformer Corp., 4414 Park Ave., New York 54, N. Y.
Ⓥ Manufacturers Thread Grinding Inc., P. O. Box 66, Catontown, N. J.
Ⓥ Microwave Equipment Co., Inc., North Caldwell, N. J.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ**POLYTECHNIC RESEARCH & DEVELOPMENT CO., INC.**, 202 Tillary St., Brooklyn 1, N. Y. ADV. PG. 56, 57.
Ⓥ Product Development Co., Inc., Arlington, N. J.
Ⓥ**RAYTHEON MFG. CO.**, Power Tube Div., Waltham 54, Mass. ADV. PG. 257.
Selectar Industries, Inc., 401 E. 138th St., New York 54, N. Y.
Ⓥ**SPERRY GYROSCOPE CO.**, Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.
VECTRON, INC., 235 High St., Waltham, Mass. ADV. PG. 266.
Ⓥ Weymouth Instrument Co., 1440 Commercial St., East Weymouth 89, Mass.

FILTERS—*Needle Scratch*

Ⓥ**BARKER & WILLIAMSON**, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ**BURNELL & CO.**, 45 Warburton Ave., Yonkers 2, N. Y. ADV. PG. 59.
Coil Winders, Inc., 61 Bergen St., Brooklyn 2, N. Y.
Ⓥ**COMMUNICATION ACCESSORIES CO.**, Box 345, 110th St. & Hillcrest Rd., Hickman Hills, Missouri. ADV. PG. 178.
Ⓥ**ELECTRONIC TRANSFORMER CO., INC.**, 215 W. 25th St., New York, N. Y. ADV. PG. 116.
Ⓥ Electronic Workshop, Inc., 351 Bleecker St., New York 14, N. Y.
Ⓥ Fairchild Recording Equipment Corp., 154 St. & 7th Avenue, Whitestone, N. Y.
Hartley Co., Ltd., H. A., 152 Hammersmith Rd., London W. 6, England.
Ⓥ Lear, Inc., 110 Ionia Ave., N. W., Grand Rapids 2, Mich.
Ⓥ Miller Co., J. W., 5917 S. Main St., Los Angeles, Calif.
Ⓥ Minnesota Electronics Corp., 97 E. Fifth St., St. Paul 1, Minn.
Ⓥ Newcomb Audio Products Co., 6824 Lexington Ave., Hollywood 38, Calif.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Scott, Inc., Hermon Hosmer, 385 Putnam Ave., Cambridge 39, Mass.
Ⓥ**UNITED TRANSFORMER CO.**, 150 Varick St., New York 13, N. Y. ADV. PG. Inside Front Cover.

FILTERS—*Radio Interference*

Ⓥ Aeronautical Radio Mfg. Co., 155 First St., Mineola, N. Y.
Ⓥ Aerovox Corp., 740 Belleville Ave., New Bedford, Mass.
Ⓥ**BARKER & WILLIAMSON**, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Birnbach Radio Co., Inc., 145 Hudson St., New York, N. Y.
Ⓥ Bud Radio, Inc., 2118 E. 55th St., Cleveland 3, Ohio.
Ⓥ**CENTRALAB DIV., OF GLOBE UNION INC.**, 900 E. Keefe Ave., Milwaukee, Wis. ADV. PG. 64, 65.
Coil Winders, Inc., 61 Bergen St., Brooklyn 2, N. Y.
Ⓥ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ**COMMUNICATION ACCESSORIES CO.**, Box 345, 110th St. & Hillcrest Rd., Hickman Hills, Mo. ADV. PG. 178.
Ⓥ**CORNELL-DUBILIER ELECTRIC CORP.**, South Plainfield, N. J. ADV. PG. 70.
Ⓥ Deutschmann Corp., Tobe, 921 Providence Highway, Norwood, Mass.
Ⓥ Filtron Co., Inc., The, 38-25 Bell Blvd., Bayside, L. I., N. Y.
Ⓥ Hallett Mfg. Co., 3601 Florence Ave., Inglewood, Calif.
Ⓥ Industrial Condenser Corp., 3243 N. California Ave., Chicago 18, Ill.
Ⓥ**J F D MFG. CO.**, 4101-23 Sixteenth Ave., Brooklyn 37, N. Y. ADV. PG. 254, 264.
Ⓥ Lear, Inc., 110 Ionia Ave., N. W., Grand Rapids 2, Mich.
Ⓥ**MEASUREMENTS CORP.**, Boonton, N. J. ADV. PG. 145.
Meissner Mfg. Div., Maguire Industries, Inc., Mt. Carmel, Ill.
Ⓥ Miller Co., J. W., 5917 S. Main St., Los Angeles, Calif.
Ⓥ Minnesota Electronics Corp., 97 E. Fifth St., St. Paul 1, Minn.

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

Ⓥ Orthon Corp., The, Electronic Div., 116 Albion Ave., Paterson 2, N. J.
Ⓥ Potter Co., 1950 Sheridan Rd., N. Chicago, Ill.
Ⓥ Sprague Electric Co., North Adams, Mass.

FILTERS—*Television*

Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 149.
Birnbach Radio Co., Inc., 145 Hudson St., New York, N. Y.
Ⓥ Caddell-Burns Mfg. Co., 460 Bessene St., New York 13, N. Y.
Ⓥ Cornell Corp., 621 W. 23rd St., New York, N. Y.
Ⓥ CENTRALAB DIV. OF GLOBE UNION INC., 900 E. Keefe Ave., Milwaukee, Wis. ADV. PG. 64, 65.
Coil Winders, Inc., 41 Bergen St., Brooklyn 2, N. Y.
Ⓥ Deutschmann Corp., Tobe, 921 Providence Highway, Norwood, Mass.
Ⓥ ELECTRONIC TRANSFORMER CO., INC., 215 W. 25th St., New York, N. Y. ADV. PG. 116.
Ⓥ Electronic Co., Inc., 60 Franklin St., East Orange, N. J.
Ⓥ Filtron Co., Inc., The, 38-25 Bell Blvd., Bayside, L. I., N. Y.
Ⓥ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
Ⓥ House of Television Inc., 40 W. 45th St., New York 12, N. Y.
Ⓥ Hunton Plastics Co., 178 S. Van Brunt St., Englewood, N. J.
Ⓥ Industrial Condenser Corp., 3243 N. Kostner Ave., Chicago 18, Ill.
Ⓥ INSULINE CORP. OF AMERICA, 36-02 36th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
Ⓥ J. F. D. MFG. CO., 4151-53 Sixteenth Ave., Brooklyn, N. Y. ADV. PG. 254, 264.
Jamaica Television Mfg. Co., 95-26 Sutphin Blvd., Jamaica 4, N. Y.
Magnavox Mfg. Div., Magnavox Industries, Inc., Mt. Carmel, Ill.
Ⓥ Mallory, Metallurgical Corp., 194 Bradford St., Brooklyn, N. Y.
Ⓥ Miller Co., J. W., 5417 S. Main St., Los Angeles, Calif.
Monroe Coil Co., 2839 N. Narragansett Ave., Chicago 34, Ill.
Ⓥ Oak Ridge Products Mfg. Div. of Video Television, 111 E. 167th St., New York 51, N. Y.
Ⓥ Orthon Corp., Electronic Division, 116 Albion Ave., Paterson 2, N. J.
Ⓥ Pioneer Scientific Corp., 295 Lafayette St., New York 12, N. Y.
Ⓥ RAYTHEON MFG. CO., Power Tube Div., Waltham 54, Mass. ADV. PG. 257.
Selector Industries, Inc., 401 E. 138th St., New York 54, N. Y.
Ⓥ Smith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.
Thall Plastic Engineering Co., 315 Flanders St., New York, N. Y.
Ⓥ Transvision Inc., 460 North Ave., New Rochelle, N. Y.
Ⓥ U. S. ELECTRONICS CORP., 276 Warren St., Jersey City, N. J. ADV. PG. 266.
Ⓥ Visionette Co., 521 Fifth Ave., New York 17, N. Y.

FILTERS—*uhf & vhf*

Ⓥ Bernco Corp., 740 Belleville Ave., New Bedford, Mass.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ Communication Products Co., Inc., Broadway & Clark St., Keyport, N. J.
Ⓥ Deutschmann Corp., Tobe, 921 Providence Highway, Norwood, Mass.
Ⓥ Filtron Co., Inc., The, 38-25 Bell Blvd., Bayside, L. I., N. Y.
Ⓥ HARNETT ELECTRIC CORP., 138 Haven Ave., Port Washington, L. I., N. Y. ADV. PG. 162.
Ⓥ LAVOIE LABORATORIES, Morganville, N. J. ADV. PG. 151.
Ⓥ Lear, Inc., 110 Sixth Ave., N. W., Grand Rapids 2, Mich.
Local Electronics Corp., 194 E. 140th St., New York 54, N. Y.
Ⓥ Manufacturers Engr. & Equip. Corp., Willow Grove, Pa.
Meissner Mfg. Div., Maguire Industries, Inc., Mt. Carmel, Ill.
Ⓥ Mitchell Industries, Inc., Long Walton, Mineral Wells, Texas.
Ⓥ Orthon Corp., The, Electronic Div., 116 Albion Ave., Paterson 2, N. J.
Ⓥ Radio Electric Co., 63 E. 16th St., New York 3, N. Y.
Ⓥ RAYTHEON MFG. CO., Power Tube Div., Waltham 54, Mass. ADV. PG. 257.
Ⓥ Rollin Co., 2070 N. Fair Oaks Ave., Pasadena 3, Calif.
Selector Industries, Inc., 401 E. 138th St., New York 54, N. Y.
Ⓥ SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 69, 70.
Ⓥ U. S. ELECTRONICS CORP., 276 Warren St., Jersey City, N. J. ADV. PG. 266.
VECTRON, INC., 235 High St., Waltham, Mass. ADV. PG. 266.

FINISHES—*Crystal*

Ⓥ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
Ⓥ Haynes Labs., Inc., C. W., 61 Chandler St., Springfield, Mass.
Ⓥ KNIGHTS CO., JAMES, 131 S. Wells St., Sandwich, Ill. ADV. PG. 190.
Ⓥ Maas & Waldstein Co., 438 Riverside Ave., Newark 4, N. J.
Ⓥ Polytech Devices, Inc., 1180 E. Grand St., Elizabeth, N. J.

FINISHES—*Enamel*

Austin Co., Inc., O., 335 Throop Ave., Brooklyn 21, N. Y.
Ⓥ Barrett Varnish Co., 1532 S. 50th Court, Cicero 50, Ill.
Ⓥ Dolph Co., John C., Monmouth Junction, N. J.
Ⓥ du Pont de Nemours & Co., Inc., E. I., Wilmington, Delaware.
Egyptian Lacquer Mfg. Co., Lafayette, Ind.
Ⓥ Franklin Paint & Varnish Co., Benjamin, 4820 Lansdale St., Philadelphia 24, Pa.
Ⓥ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
Ⓥ Haynes Labs., Inc., C. W., 61 Chandler St., Springfield, Mass.
Ⓥ Horn Co., Inc., A. C., 10th St. & 44th Ave., Long Island City 1, N. Y.
Ⓥ Maas & Waldstein Co., 438 Riverside Ave., Newark 4, N. J.
Ⓥ Minute Man Products, Inc., 109 E. 22nd St., New York 10, N. Y.
Ⓥ Production Engineering Co., 173 Sergeant Ave., Clifton, N. J.
Ⓥ Schenectady Varnish Co., Schenectady, N. Y.
Ⓥ Sessions Clock Co., Forestville, Conn.
Ⓥ Sherwin-Williams Co., 101 Prospect Ave., N. W., Cleveland 1, Ohio.
Ⓥ Standard Varnish Works, 2600 Richmond Terrace, Staten Island 3, N. Y.

FINISHES—*Lacquer*

Austin Co., Inc., O., 335 Throop Ave., Brooklyn 21, N. Y.
Ⓥ Barrett Varnish Co., 1532 S. 50th Court, Cicero 50, Ill.
Ⓥ Dolph Co., John C., Monmouth Junction, N. J.
Ⓥ du Pont de Nemours & Co., Inc., E. I., Wilmington, Delaware.
Egyptian Lacquer Mfg. Co., Lafayette, Ind.
Ⓥ Franklin Paint & Varnish Co., Benjamin, 4820 Lansdale St., Philadelphia 24, Pa.
Ⓥ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
Ⓥ Haynes Labs., Inc., C. W., 61 Chandler St., Springfield, Mass.
Ⓥ Horn Co., Inc., A. C., 10th St. & 44th Ave., Long Island City 1, N. Y.
Ⓥ Irvington Varnish & Insulator Co., 10 Argyle Terrace, Irvington 11, N. J.
Ⓥ Maas & Waldstein Co., 438 Riverside Ave., Newark 4, N. J.
Ⓥ MICRO CIRCUITS CO., New Buffalo, Mich. ADV. PG. 220.
Ⓥ Minute Man Products, Inc., 109 E. 22nd St., New York 10, N. Y.
Ⓥ Production Engineering Co., 173 Sergeant Ave., Clifton, N. J.
Ⓥ Sessions Clock Co., Forestville, Conn.
Ⓥ Sherwin-Williams Co., 101 Prospect Ave., N. W., Cleveland 1, Ohio.
Ⓥ Standard Varnish Works, 2600 Richmond Terrace, Staten Island 3, N. Y.
United Shoe Machinery Corp., 142 Federal St., Boston, Mass.

FINISHES—*Luminous Materials*

Austin Co., Inc., O., 335 Throop Ave., Brooklyn 21, N. Y.
Ⓥ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
Ⓥ Haynes Labs., Inc., C. W., 61 Chandler St., Springfield, Mass.
Ⓥ Maas & Waldstein Co., 438 Riverside Ave., Newark 4, N. J.
Ⓥ Sylvania Luminous Materials Co., 7356 Santa Monica Blvd., Hollywood 46, Calif.

FINISHES—*Ripple*

Austin Co., Inc., O., 335 Throop Ave., Brooklyn 21, N. Y.
Ⓥ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
Ⓥ Haynes Labs., Inc., C. W., 61 Chandler St., Springfield, Mass.
Ⓥ Maas & Waldstein Co., 438 Riverside Ave., Newark 4, N. J.
Ⓥ Schmitt Co., Walter L., 9306 Santa Monica Blvd., Beverly Hills, Calif.
Ⓥ Standard Varnish Works, 2600 Richmond Terrace, Staten Island 3, N. Y.

FINISHES—*Varnish*

Ⓥ Acme Wire Co., New Haven 14, Conn.
Austin Co., Inc., O., 335 Throop Ave., Brooklyn 21, N. Y.
Ⓥ Barrett Varnish Co., 1532 S. 50th Court, Cicero 50, Ill.
Ⓥ du Pont de Nemours & Co., Inc., E. I., Wilmington, Delaware.
Egyptian Lacquer Mfg. Co., Lafayette, Ind.
Ⓥ Franklin Paint & Varnish Co., Benjamin, 4820 Lansdale St., Philadelphia 24, Pa.
Ⓥ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
Ⓥ Haynes Labs., Inc., C. W., 61 Chandler St., Springfield, Mass.
Ⓥ Irvington Varnish & Insulator Co., 10 Argyle Terrace, Irvington 11, N. J.
Ⓥ Maas & Waldstein Co., 438 Riverside Ave., Newark 4, N. J.
Ⓥ New Wrinkle, Inc., 1819 Bankers Bldg., 105 W. Adams Ave., Chicago 3, Ill.
Ⓥ Production Engineering Co., 173 Sergeant Ave., Clifton, N. J.
Ⓥ Schenectady Varnish Co., Schenectady, N. Y.
Ⓥ Sessions Clock Co., Forestville, Conn.
Ⓥ Sherwin-Williams Co., 101 Prospect Ave., N. W., Cleveland 1, Ohio.
Ⓥ Standard Varnish Works, 2600 Richmond Terrace, Staten Island 3, N. Y.

FLEXIBLE SHAFT EQUIPMENT

See Machines

FLOCK & FLOCKED PAPER

Austin Co., Inc., O., 335 Throop Ave., Brooklyn 21, N. Y.
Ⓥ Beir-Manning Div. of Norton Co., Troy, N. Y.
Ⓥ Hentcraft Products, 14 Delancey St., New York, N. Y.
Ⓥ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
Ⓥ Maas & Waldstein Co., 438 Riverside Ave., Newark 4, N. J.

FLUORESCENT COMPOUNDS—*Phosphors*

Aerolux Light Corp., 653 11th Ave., New York 19, N. Y.
Austin Co., Inc., O., 335 Throop Ave., Brooklyn 21, N. Y.
Ⓥ Canadian Radium & Uranium Corp., 630 Fifth Ave., New York 20, N. Y.
Ⓥ du Pont de Nemours & Co., E. I., Wilmington, Delaware.
Ⓥ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
Ⓥ Maas & Waldstein Co., 438 Riverside Ave., Newark 4, N. J.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
Ⓥ Shannon Luminous Materials Co., 7356 Santa Monica Blvd., Hollywood 46, Calif.
Ⓥ SYLVANIA ELECTRIC PRODUCTS, INC., 1740 Broadway, New York 19, N. Y. ADV. PG. 286 to 290.
Ⓥ U. S. Radium Corp., 535 Pearl St., New York 7, N. Y.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

FLUOROMETERS

Ⓥ Coleman Instruments, Inc., 318 Madison St., Maywood, Ill.
Ⓥ Farrand Optical Co., Inc., Bronx Blvd. at 238th St., New York 66, N. Y.
Photovolt Corp., 95 Madison Ave., New York 16, N. Y.
Ⓥ Robilcon Co., 3751 Ridge Ave., Philadelphia, Pa.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.

FLUX—*Brazing Compounds*

American Solder & Flux Co., 2152 E. Norris St., Philadelphia 25, Pa.
Ⓥ Chase Brass & Copper Co., Inc., Waterbury 91, Conn.
Ⓥ Division Lead Co., 836 W. Kinzie St., Chicago 22, Ill.
Eastern Metals Industries, 250 W. 34th St., New York 14, N. Y.
Eutectic Welding Alloys Corp., 40 Worth St., New York 13, N. Y.
Ⓥ Fluxaloy Co., 1245 N. 26th St., Philadelphia 21, Pa.
Ⓥ GLASER LEAD CO., INC., 31 Wyckoff Ave., Brooklyn, N. Y. ADV. PG. 251.
Goldsmith Bros. Smelting & Refining Co., 109 N. Wabash Ave., Chicago 2, Ill.
Ⓥ Handy & Harman, 82 Fulton St., New York 7, N. Y.
Ⓥ MAKEPEACE CO., D. E., Attleboro, Mass. ADV. PG. 97.
Ⓥ Soldering Specialties Co., Summit, N. J.
Special Chemicals Corp., 30 Irving Pl., New York 3, N. Y.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

FLUX—*Brazing & Soldering*

Ⓥ**AMERICAN PLATINUM WORKS**, N. J. R. R. Ave. at Oliver St., Newark 5, N. J. ADV. PG. 265.
American Solder & Flux Co., 2152 E. Norris St., Philadelphia 25, Pa.
Ⓥ Division Lead Co., 836 W. Kinzie St., Chicago 22, Ill.
Eastern Metals Industries, 250 W. 54th St., New York 19, N. Y.
Eutectic Welding Alloys Corp., 40 Worth St., New York 13, N. Y.
Ⓥ Farrerlloy Co., 1245 N. 26th St., Philadelphia 21, Pa.
Ⓥ**GLASER LEAD CO., INC.**, 31 Wyckoff Ave., Brooklyn, N. Y. ADV. PG. 251.
Ⓥ Handy & Harman, 82 Fulton St., New York 7, N. Y.
Johnson Mfg. Co., Inc., Mt. Vernon, Iowa.
Ⓥ Linick Chemical Co., 29 E. Madison St., Chicago 2, Ill.
Ⓥ**MAKEPEACE CO., D. E.**, Attleboro, Mass. ADV. PG. 97.
Ⓥ Soldering Specialties Co., Summit, N. J.
Special Chemicals Corp., 30 Irving Pl., New York 3, N. Y.
Ⓥ Superior Flux & Mfg. Co., 1302 Ontario St., Cleveland 13, Ohio.
Ⓥ**WESTINGHOUSE ELECTRIC CORP.**, P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

FLUX—*Soldering*

Ⓥ Allen Co., Inc., L. B., 6751 Bryn Mawr Ave., Chicago 31, Ill.
Ⓥ Aluminum Co. of America, Gulf Bldg., Pittsburgh, Pa.
Ⓥ American Chemical Paint Co., Ambler, Pa.
American Solder & Flux Co., 2152 E. Norris St., Philadelphia 25, Pa.
Ⓥ Burnley Battery & Mfg. Co., Clay St., North East, Pa.
Ⓥ Decimeter, Inc., 1430 Market St., Denver 2, Colorado.
Ⓥ Division Lead Co., 836 W. Kinzie St., Chicago 22, Ill.
Ⓥ du Pont de Nemours & Co., Inc., E. I., Wilmington, Delaware.
Exide Electric Mfg. Co., Inc., 23-10 Bridge Plaza S., Long Island City, N. Y.
Eastern Metals Industries, 250 W. 54th St., New York 19, N. Y.
Eutectic Welding Alloys Corp., 40 Worth St., New York 13, N. Y.
Ⓥ Farrerlloy Co., 1245 N. 26th St., Philadelphia 21, Pa.
Ⓥ**GENERAL CEMENT MFG. CO.**, 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
Ⓥ**GLASER LEAD CO., INC.**, 31 Wyckoff Ave., Brooklyn, N. Y. ADV. PG. 251.
Johnson Mfg. Co., Inc., Mt. Vernon, Iowa.
Ⓥ**KESTER SOLDER CO.**, 4212 Wrightwood Ave., Chicago 39, Ill. ADV. PG. 267.
Ⓥ Lewis Mfg. Co., 30 Cunnington St., Boston 15, Mass.
Ⓥ Linick Chemical Co., 29 E. Madison St., Chicago 2, Ill.
Ⓥ Merck & Co., Inc., Rahway, N. J.
Ⓥ**MULTICORE SALES CORP.**, 164 Duane St., New York 13, N. Y. ADV. PG. 21.
Ⓥ Ohio Carbon Co., 12508 Berea Rd., Cleveland 11, Ohio.
Ⓥ Osborn Products, 475 Main St., Glen Ellyn, Ill.
Ⓥ Pfanstiehl Chemical Co., Metallurgical Div., 104 Lake View Ave., Waukegan, Ill.
Ⓥ Ruby Chemical Co., 68 MacDowell St., Columbus, Ohio.
Ⓥ Ryerson & Son, Inc., J. T., Box 8000-A, Chicago, Ill.
Ⓥ Soldering Specialties Co., Summit, N. J.
Special Chemicals Corp., 30 Irving Place, New York 3, N. Y.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ Superior Flux & Mfg. Co., 1302 Ontario St., Cleveland 13, Ohio.
Ⓥ**WESTINGHOUSE ELECTRIC CORP.**, P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Ⓥ**ZOPHAR MILLS, INC.**, 112-130 26th St., Brooklyn 32, N. Y. ADV. PG. 192.

FLUXMETERS

Ⓥ Associated Research, Inc., 3758 W. Belmont, Chicago 18, Ill.
Ⓥ**C. G. S. LABORATORIES, INC.**, 36 Ludlow St., Stamford, Conn. ADV. PG. 244.
Ⓥ**GENERAL ELECTRIC CO.**, Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
Ⓥ**MARION ELECTRICAL INSTRUMENT CO.**, Manchester, N. H. ADV. PG. 130.
Ⓥ Rawson Electrical Instrument Co., 111 Potter St., Cambridge 42, Mass. ADV. PG. 156.
Ⓥ Rubicon Co., 3751 Ridge Ave., Philadelphia, Pa.
Ⓥ Sensitive Research Instrument Corp., 9 Elm Ave., Mt. Vernon, N. Y.
Ⓥ Varian Associates, 99 Washington St., San Carlos, Calif.

FOCUS COILS

See Coils, Television Focusing

FORKS—*Electrically Driven Tuning*

Ⓥ Acme Telectronix Div. of NEA Service, Inc., West Third & Lakeside, Cleveland 13, Ohio.
Ⓥ**AMERICAN TIME PRODUCTS, INC.**, 580 Fifth Ave., New York 19, N. Y. ADV. PG. 60.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ Gaertner Scientific Corp., 1201 Wrightwood Ave., Chicago 14, Ill.
Ⓥ**GENERAL RADIO CO.**, 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Ⓥ Hathaway Instrument Co., 1315 S. Clarkson St., Denver 10, Colo.
Macleod & Hanopol, Joiner St., Charlestown 29, Mass.
Ⓥ**MUIRHEAD CO., INC.**, Beckenham-Kent England. ADV. PG. 71.
Ⓥ**PHILAMON LABORATORIES**, 5717 Third Ave., Brooklyn 20, N. Y. ADV. PG. 84.
Ⓥ Stancil-Hoffman Corp., 1016 N. Highland Ave., Hollywood 38, Calif.
Ⓥ**TIMES FACSIMILE CORP.**, 229 W. 43rd St., New York 18, N. Y. ADV. PG. 50.
Ⓥ Varo Mfg. Co., Inc., Box 618, Garland, Texas.

FORMS—*Antenna*

Electronic Mechanics, Inc., 70 Clifton Blvd., Clifton, N. J.
Ⓥ Oak Ridge Products Mfg. Div. of Video Television, Inc., 234 E. 127th St., New York 35, N. Y.
Ⓥ Thor Ceramics Inc., 225 Belleville Ave., Bloomfield, N. J.

FORMS—*Coil*

See Also Bobbins

Ⓥ**ACCURATE PAPER TUBE CO.**, 851 N. Noble St., Chicago 22, Ill. ADV. PG. 268.
Ⓥ**ALDEN PRODUCTS CO.**, 117 N. Main St., Brockton 64, Mass. ADV. PG. 235.
Ⓥ**AMERICAN LAVA CORP.**, Chattanooga 5, Tenn. ADV. PG. 27.
Ⓥ**AMERICAN MOLDED PRODUCTS CO.**, 1644 N. Honore St., Chicago 22, Ill. ADV. PG. 263.
Ⓥ**AMERICAN PHENOLIC CORPORATION**, 1830 S. 54th Ave., Chicago 50, Ill. ADV. PG. 191.
Ⓥ Automatic Mfg. Corp., 65 Gouverneur St., Newark 4, N. J.
Ⓥ Bud Radio Inc., 2118 E. 55th St., Cleveland 3, Ohio.
Ⓥ Bunnell & Co., J. H., 726 Stanton St., Toledo, Ohio.
Ⓥ**CAMBRIDGE THERMIONIC CORP.**, 445 Concord Ave., Cambridge, Mass. ADV. PG. 72.
CENTRALAB DIV. of Globe Union, Inc., 900 E. Keefe Ave., Milwaukee 1, Wis. ADV. PG. 64, 65.
Ⓥ Citation Products Co., 233 E. 146th St., New York 51, N. Y.
Ⓥ**CLEVELAND CONTAINER CO., THE**, 6201 Barberton Ave., Cleveland 2, Ohio. ADV. PG. 253.
Coil Winders Inc., 61 Bergen St., Brooklyn 2, N. Y.
Ⓥ Continental Diamond Fibre Co., 16 Chapel St., Newark 1e, Del.
Ⓥ**CORNING GLASS WORKS**, Corning, N. Y. ADV. PG. 134.
Electronic Mechanics, Inc., 70 Clifton Blvd., Clifton, N. J.
Felsenthal & Sons, Inc., G., 4100 W. Grand Ave., Chicago 51, Ill.
Ⓥ Insulating Tube Co., 26 Cottage St., P. O. Box 1, Poughkeepsie, N. Y.
Ⓥ**INSULINE CORP. OF AMERICA**, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
Ⓥ Kirchberger & Co., Inc., M., 1425 37th St., Brooklyn 18, N. Y.
Ⓥ Mayfair Molded Products Corp., 4440 N. Elston Ave., Chicago 30, Ill.
Meissner Mfg. Div., Maguire Industries, Inc., Mt. Carmel, Ill.
Ⓥ McLarta Fabricators, Inc., 5324 Ravenswood Ave., Chicago 40, Ill.
Ⓥ Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.
Ⓥ Molded Insulation Co., Aircraft Control Div., 335 E. Price St., Philadelphia, Pa.
Ⓥ**MYCALEX CORP. OF AMERICA**, 60 Clifton Blvd., Clifton, N. J. ADV. PG. 163.
Ⓥ**NATIONAL CO., INC.**, 61 Sherman St., Malden 48, Mass. ADV. PG. 33 to 36.
Ⓥ**NATIONAL MOLDITE CO.**, 1410 Chestnut Ave., Hillside 5, N. J. ADV. PG. 200.
Plastic Accessories, Inc., 93 Mercer St., New York 12, N. Y.
Ⓥ**PRECISION PAPER TUBE CO.**, 2033 W. Charleston St., Chicago 47, Ill. ADV. PG. 215.
Printloid Inc., 96 Mercer St., New York, N. Y.
Ⓥ Quality Components, Inc., St. Marys, Pa.
Ⓥ Speer Resistor Corp., St. Marys, Pa.
Ⓥ**STACKPOLE CARBON CO.**, St. Marys, Pa. ADV. PG. 166, 167.
Ⓥ Stevens Products Inc., 86-88 Main St., East Orange, N. J.
Ⓥ Stolle Engineering & Mfg. Co., 3970 S. Grand Ave., Los Angeles 37, Calif.
Ⓥ**STUPAKOFF CERAMIC & MFG. CO.**, Latrobe, Pa. ADV. PG. 147.
Ⓥ Taylor Fibre Co., Norristown, Pa.
Ⓥ Thor Ceramics Inc., 225 Belleville Ave., Bloomfield, N. J.
Ⓥ Waterbury Companies, Inc., Waterbury 90, Conn.

FORMS—*Resistor*

Ⓥ**AMERICAN LAVA CORP.**, Chattanooga 5, Tenn. ADV. PG. 27.
Atlas Electric Products Co., P. O. Box 1591, Erie, Pa.
Ⓥ**CENTRALAB**, Div. of Globe Union, Inc., 900 E. Keefe Ave., Milwaukee 1, Wis. ADV. PG. 64, 65.
Ⓥ**CORNING GLASS WORKS**, Corning, N. Y. ADV. PG. 134.
Electronic Mechanics, Inc., 70 Clifton Blvd., Clifton, N. J.
Ⓥ**INTERNATIONAL RESISTANCE CO.**, 401 N. Broad St., Philadelphia 8, Pa. ADV. PG. 88, 89.
Ⓥ Kirchberger & Co., Inc., M., 1425 37th St., Brooklyn 18, N. Y.
Ⓥ Louthan Mfg. Co., East Liverpool, Ohio.
Ⓥ Molded Insulation Co., Aircraft Control Div., 335 E. Price St., Philadelphia, Pa.
Ⓥ**MYCALEX CORP. OF AMERICA**, 60 Clifton Blvd., Clifton, N. J. ADV. PG. 163.
Ⓥ Speer Resistor Corp., St. Marys, Pa.
Ⓥ**STUPAKOFF CERAMIC & MFG. CO.**, Latrobe, Pa. ADV. PG. 147.
Ⓥ Thor Ceramics Inc., 225 Belleville Ave., Bloomfield, N. J.

FORMS—*Wire*

Accurate Spring Mfg. Co., 3811 W. Lake St., Chicago, Ill.
Ⓥ**ART WIRE & STAMPING CO.**, 227 High St., Newark 2, N. J. ADV. PG. 198.
Ⓥ Barnes-Gibson-Raymond Div. of Associated Spring Corp., 5400 Miller Ave., Detroit 11, Mich.
Ⓥ Carboloy Company Inc., 11139 E. Eight Mile Blvd., Detroit 32, Mich.
Ⓥ Cuyahoga Spring Co., 10272 Berea Rd., Cleveland, Ohio.
Ⓥ Grammes & Sons Inc., L. F., 389 Union St., Allentown 2, Pa.
Ⓥ Hubbard Spring Co., M. D., Central Ave., Pontiac, Mich.
Ⓥ Judd Co., H. L., 87 Chambers St., New York 7, N. Y.
Ⓥ Star Expansion Products Co., 147-149 Cedar St., New York 6, N. Y.
Ⓥ Thor Ceramics Inc., 225 Belleville Ave., Bloomfield, N. J.
Ⓥ**WEBSTER SPRING CORP.**, 176-182 Johnson St., Brooklyn 1, N. Y. ADV. PG. 237, 278.
Ⓥ Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp., 500 Fifth Ave., New York 18, N. Y.

FREQUENCY STANDARDS

See Standards—Frequency

FURNACES—*High Frequency*

Ⓥ Ajax Electrothermic Corp., Ajax Park, Trenton 5, N. J.
Ⓥ Allis Chalmers Mfg. Co., 935 South 70th St., Milwaukee 1, Wis.
Ⓥ Electronic Engineering Corp., 624 Ridge Rd., Lyndhurst, N. J.
Ⓥ**GENERAL ELECTRIC CO.**, Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ High Frequency Heating Co., 143 Glen Park Ave., Gary, Ind.
Ⓥ Lepel High Frequency Labs., Inc., 39 W. 60th St., New York 23, N. Y.
Ⓥ Sherman Industrial Electronics Co., 505 Washington Ave., Belleville 9, N. J.
Westronic Co., 19500 West 8 Mile Rd., Detroit 19, Mich.

FUSE HOLDERS

See Blocks

FUSES

Ⓥ Bel Fuse Inc., 311 Mountain Road, Union City, N. J.
Ⓥ**BUSSMANN MFG CO.**, St. Louis 7, Mo. ADV. PG. 82.
Ⓥ**CHATHAM ELECTRONICS CORP.**, 475 Washington St., Newark 2, N. J. ADV. PG. 176.
Ⓥ Economy Fuse & Mfg. Co., 2717 Greenview Ave., Chicago 14, Ill.
Ⓥ**GENERAL ELECTRIC CO.**, Construction Materials Dept., 1285 Boston Ave., Bridgeport 2, Conn. ADV. PG. 5 to 18.
Jefferson Electric Co., Bellwood, Ill.
Ⓥ**LITTELFUSE, INC.**, 4757 Ravenswood Ave., Chicago 40, Ill. ADV. PG. 164.
Ⓥ Price Fuse Mfg. Co., 2948 N. Fifth, Milwaukee 12, Wis.
Ⓥ**WESTINGHOUSE ELECTRIC CORP.**, P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

GAGES—*Comparator*

Ⓥ Engineers Specialties Div., Universal Engraving & Colorplate Co., 980 Ellicott St., Buffalo 9, N. Y.
Ⓥ**GENERAL ELECTRIC CO.**, Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Metron Instrument Co., 432 Lincoln St., Denver 9, Colo.
Scherr Co., Inc., Geo., 200 Lafayette St., New York 12, N. Y.

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

Ⓥ Stevens-Arnold Inc., 22 Elkins St., South Boston 27, Mass.
Ⓥ U. S. Gauge Div., American Machine & Metals, Inc., Sellersville, Pa.

GAGES—*Displacement Measuring*

Ⓥ Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.
Ⓥ BRUSH DEVELOPMENT CO., 3405 Perkins Ave., Cleveland 14, Ohio. ADV. PG. 124, 125.
Ⓥ GULTON MFG. CORP., Metuchen, N. J. ADV. PG. 260.
Ⓥ INDUSTRIAL ELECTRONICS, INC., 2457 Woodward Ave., Detroit 1, Mich. ADV. PG. 255.
Ⓥ Massa Laboratories, 3868 Carnegie St., Cleveland, Ohio.
Ⓥ Photocon Research Products, 1062 N. Allen Ave., Pasadena 7, Calif.
Ⓥ Schaevitz Engineering, Crescent Blvd. at Drexel Ave., Pennsauken Township, Camden 11, N. J.
Ⓥ Statham Laboratories, Inc., 9126 Santa Monica Blvd., Beverly Hills, Calif.
Ⓥ Technology Instrument Corp., 1075 Main St., Waltham 54, Mass.

GAGES—*Electronic Fuel Indicator*

Ⓥ A. I. Associates, Inc., Teterboro, N. J.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Minneapolis-Honeywell Regulator Co., 2753 Fourth Ave. S., Minneapolis, Minn.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.

GAGES—*Electronic Inspection*

Ⓥ AIRCRAFT ELECTRONICS ASSOCIATES, INC., 1091 East Main Ave., Hartford 10, Conn. ADV. PG. 214.
Ⓥ AMMA CORP., 254 36th St., Brooklyn 32, N. Y. ADV. PG. 146.
Ⓥ Automatic Instruments Inc., 416 Fairfield Ave., Stamford, Conn.
Ⓥ Electronic Control Corp., 1075 E. Forest Ave., Detroit, Mich.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ INDUSTRIAL ELECTRONICS, INC., 2457 Woodward Ave., Detroit 1, Mich. ADV. PG. 255.
Ⓥ Photocon Research Products, 1062 N. Allen Ave., Pasadena 7, Calif.
Sifort Co., Inc., George, 200 Lafayette St., New York 12, N. Y.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ Stoddard Electronic Research Corp., 2 East End Ave., New York 21, N. Y.
Ⓥ Stevens-Arnold Inc., 22 Elkins St., South Boston 27, Mass.
Ⓥ Tinnerman Inc., 130 High St., Boston 10, Mass.

GAGES—*Electronic Spring Checking*

Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.

GAGES—*Ionization*

Ⓥ Automatic Products, Industrial Vacuum Equipment Div., 755 Ridge Rd., W. Rochester 3, N. Y.
Ⓥ Electronic Control Corp., 1075 E. Forest Ave., Detroit, Mich.
Ⓥ Electronic Brazing Co., 140 Glenridge Ave., Montclair, N. J.
Ⓥ Frederick Co., Geo. F., Bethayres, Pa.
Ⓥ Ilico Industries, San Carlos, Calif.
Ⓥ Manufacturers Engr. & Equip. Corp., Willow Grove, Pa.
Ⓥ Mathewson Research Corp., 70 Memorial Drive, Cambridge 42, Mass.
Ⓥ Metropolitan Vickers Radio Corp., 390 Gerrard Rd., Orange, N. J.
Ⓥ Process & Instruments, 40 Greenpoint Ave., Brooklyn 22, N. Y.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75. Inside Back and Back Covers.
Ⓥ Radiophysics Products Inc., 4201 E. Woodbridge St., Detroit 7, Mich.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

GAGES—*Paint Depth*

Ⓥ Automatic Instruments Inc., 416 Fairfield Ave., Stamford, Conn.
Ⓥ Electronic Control Corp., 1075 E. Forest Ave., Detroit, Mich.
Ⓥ Electronic Brazing Co., 140 Glenridge Ave., Montclair, N. J.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.

GAGES—*Photoelectric Dimension*

Ⓥ Electronic Control Corp., 1579 E. Forest Street, Detroit, Mich.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Industrial Electronics Co., Inc., Hanover, Mass.
Ⓥ Photobell Company, 114 Nassau St., New York 7, N. Y.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ Standard Electronics Research Corp., 2 East End Ave., New York 21, N. Y.
VECTRON, INC., 235 High St., Waltham, Mass. ADV. PG. 266.

GAGES—*Pirani*

Ⓥ Continental Electric Co., Geneva, Ill.
Ⓥ Distillation Products Industries, Vacuum Equipment Div., 755 Ridge Rd., W. Rochester 3, N. Y.
Electronic Brazing Co., 140 Glenridge Ave., Montclair, N. J.
Ⓥ Frederick Co., Geo. F., Bethayres, Pa.
Ⓥ Manufacturers Engr. & Equip. Corp., Willow Grove, Pa.
Ⓥ Precision Resistor Co., 334 Badger Ave., Newark 8, N. J.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75. Inside Back and Back Covers.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.

GAGES—*Pressure*

Airplane & Marine Instruments, Inc., Clearfield, Pa.
Ⓥ Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.
Ⓥ Bailey Meter Co., 1044 Ivanhoe Rd., Cleveland 10, Ohio.
Ⓥ Baldwin Locomotive Works, Philadelphia 42, Pa.
Ⓥ Clarkston Corp., 11927 SW Pico Blvd., Los Angeles 64, Calif.
Ⓥ Control Engineering Corp., 861 Washington St., Canton, Mass.
Ⓥ Dillon & Co., Inc., W. C., 5410 W. Harrison St., Chicago 44, Ill.
Ⓥ ECLIPSE-PIONEER DIV., Bendix Aviation Corp., Teterboro, N. J. ADV. PG. 176.
Ⓥ Electric Autolite Co., The, Toledo 1, Ohio.
Ⓥ Fiteline-Angus Co., Inc., P. O. Box 596, Indianapolis 6, Ind.
Ⓥ FLADER, INC., FREDERIC, North Tonawanda, N. Y. ADV. PG. 240.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ GRAY RESEARCH & DEVELOPMENT CO., 16 Arbor St., Hartford 1, Conn. ADV. PG. 219.
Ⓥ Hastings Instrument Co., Box 1275, Hampton, Va.
Ⓥ Hathaway Instrument Co., 1315 S. Clarkson St., Denver 10, Colo.
Ⓥ INDUSTRIAL ELECTRONICS, INC., 2457 Woodward Ave., Detroit 1, Michigan. ADV. PG. 255.
Ⓥ Livingston Electronic Corp., Livingston, N. J.
Ⓥ Manning, Maxwell & Moore, Inc., Stratford, Conn.
Ⓥ Massa Laboratories, 3868 Carnegie St., Cleveland, Ohio.
Ⓥ Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Roberts Aves., Philadelphia 44, Pa.
Ⓥ Photocon Research Products, 1062 N. Allen Ave., Pasadena 7, Calif.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Sierra Electronic Corp., San Carlos, Calif.
Ⓥ Statham Laboratories, Inc., 9126 Santa Monica Blvd., Beverly Hills, Calif.
Ⓥ Stein-Sutton, Inc., Bedford Airport, Bedford, Mass.
Ⓥ U. S. Gauge Div., American Machine & Metals, Inc., Sellersville, Pa.
Ⓥ Wallace & Tiernan Products Inc., Belleville 9, N. J.

GAGES—*Strain*

American Instrument Co., 8010 Georgia Ave., Silver Spring, Md.
Ⓥ Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.
Ⓥ Baldwin Locomotive Works, Philadelphia 42, Pa.
Ⓥ Clarkston Engineering Corp., 963 Washington St., Canton, Mass.
Ⓥ Dillon & Co., Inc., W. C., 5410 Harrison St., Chicago 44, Ill.
Ⓥ Hathaway Instrument Co., 1315 S. Clarkson St., Denver 10, Colorado.
Ⓥ INDUSTRIAL ELECTRONICS, INC., 2457 Woodward Ave., Detroit 1, Mich. ADV. PG. 255.
Ⓥ Minneapolis-Honeywell Regulator Co., 2753 Fourth Avenue S., Minneapolis, Minn.
Ⓥ MUIRHEAD & CO., LTD., Beckenham Kent England. ADV. PG. 72.
Ⓥ North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ Statham Laboratories, Inc., 9126 Santa Monica Blvd., Beverly Hills, Calif.

GAGES—*Ultrasonic Thickness*

Branson Instruments, Inc., 438 Fairfield Ave., Stamford, Conn.
Engineering Lab., Inc., 602 E. 4th St., Tulsa 3, Okla.
Ⓥ Photocon Research Products, 1062 N. Allen Ave., Pasadena 7, Calif.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ SPERRY PRODUCTS, INC., Danbury, Conn. ADV., PG. 54.

GAGES—*Vacuum*

Ⓥ Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.
Ⓥ Bailey Meter Co., 1044 Ivanhoe Rd., Cleveland 10, Ohio.
Ⓥ Central Scientific Co., 1700 Irving Park Rd., Chicago 13, Ill.
Ⓥ Clarke Instrument Corp., 910 King St., Silver Spring, Md.
Ⓥ Continental Electric Co., Geneva, Ill.
Ⓥ Distillation Products Industries, Vacuum Equipment Div., 755 Ridge Rd., W. Rochester 3, N. Y.
Electronic Brazing Co., 140 Glenridge Ave., Montclair, N. J.
Ⓥ Fiteline-Angus Co., Inc., P. O. Box 596, Indianapolis 6, Ind.
Ⓥ Frederick Co., Geo. F., Bethayres, Pa.
Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
Ⓥ Hastings Instrument Co., Box 1275, Hampton, Va.
Ⓥ Haydu Brothers, Plainfield, N. J.
Ⓥ Litton Industries, San Carlos, Calif.
Ⓥ Manning, Maxwell & Moore, Inc., Stratford, Conn.
Ⓥ Manufacturers Engr. & Equip. Corp., Willow Grove, Pa.
Ⓥ Minneapolis-Honeywell Regulator Co., 2753 Fourth Avenue S., Minneapolis, Minn.
Ⓥ National Research Corp., 70 Memorial Drive, Cambridge 42, Mass.
Nurnberg Thermometer Co., Inc., 4 Corey St., Boston 32, Mass.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75. Inside Back and Back Covers.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ Skaneateles Mfg. Co., Inc., 122 Dickerson St., Syracuse, N. Y.
Ⓥ U. S. Gauge Div., American Machines & Metals, Inc., Sellersville, Pa.
Ⓥ Wallace & Tiernan Products, Inc., Belleville 9, N. J.
Ⓥ Welch Scientific Co., W. M., 1515 Sedgwick St., Chicago 10, Ill.

GALVANOMETERS

Ⓥ Assembly Products, Inc., Chagrin Falls 6, Ohio.
Ⓥ Associated Research, Inc., 3758 W. Belmont, Chicago 18, Ill.
Ⓥ Berndt-Bach, Inc., 7377 Beverly Rd., Los Angeles 36, Calif.
Ⓥ CENTURY GEOPHYSICAL CORP., 1333 N. Utica, Tulsa 3, Okla. ADV. PG. 237.
Ⓥ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ Consolidated Engineering Corp., 620 N. Lake Ave., Pasadena 4, Calif.
Ⓥ Edin Electronics Co., 207 Main St., Worcester, Mass.
Engineering Lab., Inc., 602 E. 4th St., Tulsa 3, Okla.
Ⓥ G-M LABORATORIES, INC., 4313 No. Knox Ave., Chicago 41. ADV. PG. 142.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Hathaway Instrument Co., 1315 S. Clarkson St., Denver 10, Colo.
Ⓥ HEILAND RESEARCH CORP., 130 E. 5th Ave., Denver 9, Colo. ADV. PG. 242.
Ⓥ J. B. T. INSTRUMENTS, INC., 441 Chapel St., New Haven 8, Conn. ADV. PG. 261.
Ⓥ Kendall & Nurthrop Co., 3970 Stenton Ave., Philadelphia 44, Pa.
Ⓥ MARION ELECTRICAL INSTRUMENT CO., Manchester, N. H. ADV. PG. 230.
Ⓥ Mecker Inc., I. A., 37-01 31st St., Long Island City, N. Y.
Ⓥ Meters, Inc., 615 Westfield Blvd., Indianapolis 20, Ind.
Ⓥ Miller Corp., Wm., 362 W. Colorado St., Pasadena, Calif.
Model Sculpture Co., Aircraft Control Div., 339 E. Luzerne St., Philadelphia, Pa.
Ⓥ MUIRHEAD & CO., LTD., Beckenham Kent England. ADV. PG. 72.
Ⓥ RAWSON ELECTRICAL INSTRUMENT CO., 111 Potter St., Cambridge 42, Mass. ADV. PG. 156.
Ⓥ Rubicon Co., 3751 Ridge Ave., Philadelphia, Pa.
Ⓥ SANBORN CO., 39 Osborn St., Cambridge 39, Mass. ADV. PG. 219.
Ⓥ Sensitive Research Instrument Corp., 9 Elm Ave., Mt. Vernon, N. Y.
Ⓥ Shaw-Eastern Industrial Electronic Co., 2831 Post Oak Rd., Houston 19, Texas.
Ⓥ Technology Instrument Corp., 1058 Main St., Waltham 54, Mass.
Ⓥ Welch Scientific Co., W. M., 1515 Sedgwick St., Chicago 10, Ill.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

GASES—*Nitrogen*

Aerolux Light Corp., 653 11th Ave., New York 19, N. Y.
Ⓥ Linde Air Products Co., Unit of Union Carbide and Carbon Corp., 30 E. 42nd St., New York 17, N. Y.

GASES—*Rare*

Aerolux Light Corp., 653 11th Ave., New York 19, N. Y.
Ⓥ Haydu Brothers, Plainfield, N. J.
Ⓥ Linde Air Products Co., Unit of Union Carbide and Carbon Corp., 30 E. 42nd St., New York 17, N. Y.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

GASKETS

Ⓥ Armstrong Cork Co., Lancaster, Pa.
Ⓥ ATLANTIC INDIA RUBBER WORKS, INC., 571 W. Polk St., Chicago 7, Ill. ADV. PG. 271.
Brandywine Fibre Co., 15th & Poplar Sts., Wilmington, Del.
Ⓥ Chase Brass & Copper Co., Inc., Waterbury 91, Conn.
Ⓥ Cl-tal-on Products Co., 233 E. 146th St., New York 51, N. Y.
Ⓥ Crane Packing Co., 1800 Cuyler Ave., Chicago 18, Ill.
Ⓥ Distillation Products Industries, Vacuum Equipment Div., 755 Ridge Rd. W., Rochester 3, N. Y.
Felsenthal & Sons, Inc., G., 4100 W. Grand Ave., Chicago 51, Ill.
Ⓥ Felt Products Mfg. Co., 1504 W. Carroll Ave., Chicago 7, Ill.
Ⓥ Felters Co., 210 South St., Boston, Mass.
Ⓥ Garlock Packing Co., Palmyra, N. Y.
Ⓥ Garrett Co., Inc., George K., D & Tioga Sts., Philadelphia 34, Pa.
Ⓥ General Tire & Rubber Co., The, Silentbloc Div., Wabash, Ind.
Ⓥ Lamicoid Fabricators, Inc., 4545 W. Cortland St., Chicago 39, Ill.
Ⓥ Moore Co., Howard J., 108 Park Row, New York 7, N. Y.
Ⓥ National Gasket & Washer Mfg. Co., Inc., 124 E. 25th St., New York 10, N. Y.
Penn Fibre & Specialty Co., 2020 E. Westmoreland St., Philadelphia 34, Pa.
Plastic Accessories, Inc., 93 Mercer St., New York 12, N. Y.
Plastoid, Inc., 95 Mercer St., New York, N. Y.
Ⓥ Taylor Fibre Co., Norristown, Pa.
Ⓥ U. S. Rubber Co., 1230 Avenue of the Americas, New York 20, N. Y.
Western Felt Works, 4029 Ogden Ave., Chicago, Ill.
Willard's, Hampden, Mass.

GEARS—*Precision*

Ⓥ Acklin Stamping Co., 1923 Nebraska Ave., Toledo 7, Ohio.
Ⓥ Air Associates, Inc., Teterboro, N. J.
Ⓥ American Ladebcher Corp., 333 W. 52nd St., New York 19, N. Y.
Ⓥ Amplex Division, Chrysler Corp., Detroit 31, Mich.
Arch Gear Works, Inc., Quincy, Mass.
Ⓥ Beaver Gear Works, Inc., 1038 Parmele St., Rockford, Ill.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ Citation Products Co., 233 E. 146th St., New York 51, N. Y.
Ⓥ Foote Brothers Gear & Machine Corp., 4545 S. Western Blvd., Chicago 9, Ill.
Ⓥ FORD INSTRUMENT CO., INC., 31-10 Thomson Ave., Long Island City, N. Y. ADV. PG. 278.
Ⓥ Gear Specialties, 2635 W. Medill Ave., Chicago 47, Ill.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Gits Molding Corp., 4600 W. Huron St., Chicago 44, Ill.
Ⓥ Manufacturers Thread Grinding Inc., P. O. Box 66, Eatontown, N. J.
Penn Fibre & Specialty Co., 2020 E. Westmoreland St., Philadelphia 34, Pa.
Ⓥ QUAKER CITY GEAR WORKS, 1908-32 N. Front St., Philadelphia, Pa. ADV. PG. 272.
Ⓥ Reeves Instrument Corp., 215 E. 91st St., New York, N. Y.
Ⓥ Shakeproof, Inc., Div. of Illinois Tool Wks., 2501 N. Keeler Ave., Chicago 39, Ill.
Ⓥ Star Expansion Products Co., 147-149 Cedar St., New York 6, N. Y.
VECTRON, INC., 235 High St., Waltham, Mass. ADV. PG. 266.

GENERATORS—*Electronic Variable Frequency*

Ⓥ Airborne Instruments Lab., Inc., 160 Old Country Rd., Mineola, L. I., N. Y.
American Electroneering Co., 2112 S. LaBrea Ave., Los Angeles, Calif.
Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ C. G. S. LABORATORIES, INC., 36 Ludlow St., Stamford, Conn. ADV. PG. 244.
Coastwise Electronics Co., Inc., 130 N. Beaudry Ave., Los Angeles, Calif.
Ⓥ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ Collins Radio Co., Cedar Rapids, Iowa.
Ⓥ Communication Measurements Lab., Inc., 120 Greenwich St., New York, N. Y.
Ⓥ Daven Co., 191 Central Ave., Newark 4, N. J.
Davies Laboratories, Inc., 4705 Queensbury Rd., Riverdale, Md.
Ⓥ ELECTRONIC MEASUREMENTS CO., Red Bank, N. J. ADV. PG. 139.
Ⓥ EL-TRONICS INC., 2649 No. Howard St., Philadelphia 33, Pa. ADV. PG. 238.
Ⓥ Feiler Engineering Co., 1601 S. Federal St., Chicago 16, Ill.
Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Ⓥ HEWLETT-PACKARD CO., 395 Page Mill Rd., Palo Alto, Calif. ADV. PG. 68, 69.
Ⓥ Jackson Electrical Instrument Co., 16 S. Patterson Blvd., Dayton 1, Ohio.
Ⓥ KAY ELECTRIC CO., 14 Maple Ave., Pine Brook, N. J. ADV. PG. 193.
Ⓥ M B MFG. CO., 1060 State St., New Haven 11, Conn. ADV. PG. 253.
Ⓥ Marconi Instruments, Ltd., 23 Beaver St., New York 4, N. Y.
Ⓥ MEASUREMENTS CORP., Boonton, N. J. ADV. PG. 145.
Ⓥ Oak Ridge Products Mfg. Div. of Video Television Inc., 239 E. 127th St., New York 35, N. Y.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Phillips Petroleum Co., Special Products Div., Bartlesville, Okla.
Ⓥ RAYTHEON MFG. CO., Power Tube Div., Waltham 54, Mass. ADV. PG. 257.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Short Wave Plastic Forming Co., 2921 W. Alameda St., Burbank, Calif.
Ⓥ Simpson Electric Co., Div. American Gage & Machine Co., 5208 W. Kinzie St., Chicago 44, Ill.
Ⓥ Southwestern Industrial Electronic Co., 2831 Post Oak Rd., Houston 19, Texas.
Ⓥ SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.
Ⓥ Stancil Hoffman Corp., 1016 N. Highland Ave., Hollywood 38, Calif.
Ⓥ Varo Mfg. Co., Inc., Box 638, Garland, Texas.
Weltronic Co., 19500 West 8 Mile Rd., Detroit 19, Mich.

GENERATORS—*Electronic Wave*

American Electroneering Co., 2112 S. La Brea Ave., Los Angeles, Calif.
Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Coastwise Electronics Co., Inc., 130 N. Beaudry Ave., Los Angeles, Calif.
Ⓥ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ Collins Radio Co., Cedar Rapids, Iowa.
Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Ⓥ HEWLETT-PACKARD CO., 395 Page Mill Rd., Palo Alto, Calif. ADV. PG. 68, 69.
Ⓥ Jackson Electrical Instrument Co., 16 S. Patterson Blvd., Dayton 1, Ohio.
Ⓥ KAY ELECTRIC CO., 14 Maple Ave., Pine Brook, N. J. ADV. PG. 193.
Ⓥ Philbrick Researches, Inc., George A., 230 Congress St., Boston 10, Mass.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ Southwestern Industrial Electronic Co., 2831 Post Oak Rd., Houston 19, Texas.
Ⓥ SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.
Ⓥ Wappler, Inc., 27 W. 24th St., New York 10, N. Y.

GENERATORS—*Gas-Engine Driven*

Buda Co., The, Harvey, Ill.
Ⓥ Columbia Electric Mfg. Co., 4519 Hamilton Ave., N. E., Cleveland 14, Ohio.
Ⓥ Continental Electric Co., Inc., 334 Ferry St., Newark 5, N. J.
Ⓥ Electric Products Co., 1725 Clarkstone Rd., Cleveland 12, Ohio.
Ⓥ Electric Specialty Co., 211 South St., Stamford, Conn.
Ⓥ Geophysical Instrument Co., 1820 N. Nash St., Arlington, Va.
Hertner Electric Co., 12690 Elmwood Ave., Cleveland, Ohio.
Ⓥ Homelite Corp., Port Chester, N. Y.
Ⓥ Kato Engineering Co., 1415 First Ave., Mankato, Minn.
Ⓥ Leland Electric Co., The, 1501 Webster St., Dayton 1, Ohio.
Ⓥ Master Mfg. & Distributing Co., S. 13th & Kentucky Ave., Sheboygan, Wis.
Ⓥ Motsinger-Arch Co., 1600 Junction Ave., Racine, Wis.
Ⓥ Onan & Sons, Inc., D. W., 3264 Royalston Ave., Minneapolis 5, Minn.
Pioneer Electric Co., 3700 E. Olympic Blvd., Los Angeles 23, Calif.
Ⓥ Pioneer Gen-E-Motor Corp., 5841 W. Dickens Ave., Chicago 39, Ill.
Ⓥ Ready Power Co., The Power Plant Div., 11231 Freud Ave., Detroit 14, Mich.

GENERATORS—*Hand Driven*

Ⓥ Burke Electric Co., 12th & Cranberry Sts., Erie, Pa.
Ⓥ CARTER MOTOR CO., 2646 N. Maplewood Ave., Chicago 47, Ill. ADV. PG. 192.
Ⓥ Continental Electric Co., Inc., 334 Ferry St., Newark 5, N. J.

GENERATORS—*Harmonic Frequency*

American Electroneering Co., 2112 S. La Brea Ave., Los Angeles, Calif.
Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Ⓥ HEWLETT-PACKARD CO., 395 Page Mill Rd., Palo Alto, Calif. ADV. PG. 68, 69.
Ⓥ KAY ELECTRIC CO., 14 Maple Ave., Pine Brook, N. J. ADV. PG. 193.
Ⓥ LAVOIE LABORATORIES, Morganville, N. J. ADV. PG. 151.
Ⓥ Lorain Products Corp., 1122 F St., Lorain, Ohio.
Ⓥ Marconi Instruments, Ltd., 23 Beaver St., New York 4, N. Y.
Metropolitan Electronics & Instruments Co., 106 Fifth Ave., New York 11, N. Y.
Monitor Products Co., 815 Fremont St., So. Pasadena, Calif.
Ⓥ NORRMAN LABORATORIES, ERNST, Williams Bay, Wis. ADV. PG. 177.
Ⓥ Oak Ridge Products Mfg. Div. of Video Television, Inc., 239 E. 127th St., New York 35, N. Y.
Ⓥ REEVES-HOFFMAN CORP., 321 Cherry St., Carlisle, Pa. ADV. PG. 32.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.

GENERATORS—*Induction and Dielectric Heating*

See Heating, Electronic

Ⓥ Ajax Electrothermic Corp., Ajax Park, Trenton 5, N. J.
Ⓥ Allis Chalmers Mfg. Co., 935 South 70th St., Milwaukee 1, Wis.
Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ Ecco High Frequency Corp., 7020 Hudson Blvd., North Bergen, N. J.
Ⓥ Electronic Engineering Corp., 624 Ridge Rd., Lyndhurst, N. J.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Haydu Brothers, Plainfield, N. J.
Ⓥ High Frequency Heating Co., 143 Glen Park Ave., Gary, Ind.
Ⓥ Lepel High Frequency Labs., Inc., 39 W. 60th St., New York 23, N. Y.
Ⓥ Ohio Crankshaft Co., Tocco Div., 3800 Harvard Ave., Cleveland 1, Ohio.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
Ⓥ RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
Ⓥ Sherman Industrial Electronics Co., 505 Washington Ave., Belleville 9, N. J.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Short Wave Plastic Forming Co., 2921 W. Alameda St., Burbank, Calif.
Weltronic Co., 19500 West 8 Mile Rd., Detroit 19, Mich.
Woodworking, Inc., 3000 W. Olive Ave., Burbank, Calif.

GENERATORS—*Motor*

Ⓥ Air Associates, Inc., Teterboro, N. J.
Ⓥ Allis-Chalmers Mfg. Co., 935 South 70th St., Milwaukee 1, Wis.
Ⓥ Allis Co., Louis, 427 E. Stewart St., Milwaukee 7, Wis.
American Electric Motors, Inc., Los Angeles, Calif.
Ⓥ Ampex Electric Corp., 1155 Howard Ave., San Carlos, Calif.
Bodine Electric Mfg. Co., 52 Iowa Ave., Paterson, N. J.
Ⓥ Burke Electric Co., 12th & Cranberry Sts., Erie, Pa.
Ⓥ CARTER MOTOR CO., 2646 Maplewood Ave., Chicago 47, Ill. ADV. PG. 192.
Ⓥ Century Electric Co., 1806 Pine St., St. Louis 3, Mo.
Ⓥ Columbia Electric Mfg. Co., 4519 Hamilton Ave., N. E., Cleveland 14, Ohio.
Ⓥ Continental Electric Co., Inc., 334 Ferry St., Newark 5, N. J.

V indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

V Diehl Mfg. Co., 1129 Finderne Ave., Somerville, N. J.
V EASTERN AIR DEVICES, INC., 585 Dean St., Brooklyn 17, N. Y. ADV. PG. 258.
V Elcor, Inc., 1501 W. Congress St., Chicago 7, Ill.
V ELECTRIC INDICATOR CO., 21 Parker Ave., Stamford, Conn. ADV. PG. 160.
V Electric Products Co., 1725 Clarkstone Road, Cleveland 12, Ohio.
V Electric Specialty Co., 211 South St., Stamford, Conn.
Electro-Aire, Inc., 11439 Vanowen St., North Hollywood, Calif.
V GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
V Geophysical Instrument Co., 1620 N. Nash St., Arlington, Va.
V Guttard Mfg. Co., 2110 Clear Lake Ave., Springfield, Ill.
V Great Lakes Electric Mfg. Co., 17 S. Desplaines St., Chicago 6, Ill.
Hertner Electric Co., 12690 Elmwood Ave., Cleveland 11, Ohio.
V Jarrette Mfg. Co., 556 W. Monroe St., Chicago 6, Ill.
V Kato Engineering Co., 1415 First Ave., Mankato, Minn.
V KOLLSMAN INSTRUMENT DIV. OF SQUARE D CO., 80-08 45th Ave., Elmhurst, N. Y. ADV. PG. 116.
V Lear, Inc., 110 Ionia Ave., N. W., Grand Rapids 2, Mich.
V LELAND ELECTRIC CO., The, 1501 Webster St., Dayton 1, Ohio. ADV. PG. 246, 247.
V Motorsearch Co., 1600 Junction Ave., Racine, Wis.
V Ohio Crankshaft Co., Tocco Div., 3800 Harvard Ave., Cleveland 1, Ohio.
Pioneer Electric Co., 3700 E. Olympic Blvd., Los Angeles 23, Calif.
V Pioneer Gen-E-Motor Corp., 5841 W. Dickens Ave., Chicago 39, Ill.
V RED BANK DIVISION, Bendix Aviation Corp., Red Bank, N. J. ADV. PG. 61, 127.
V Robbins & Myers, Inc., 1345 Lagonda Ave., Springfield 99, Ohio.
V Star Kimble Electric Co., 200 Bloomfield Ave., Bloomfield, N. J.
V WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

GENERATORS—*Pulse*

V BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
V Berkeley Scientific Co., Richmond, Calif.
V Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
V ELECTRONIC TUBE CORP., 1200 E. Mermaid Lane, Philadelphia 18, Pa. ADV. PG. 156.
V FLADER, INC., FREDERIC, North Tonawanda, N. Y. ADV. PG. 240.
V General Communication Co., 530 Commonwealth Ave., Boston 15, Mass.
V GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
V GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Jamaica Television Mfg. Co., 95-26 Sutphin Blvd., Jamaica 6, N. Y.
V KAY ELECTRIC CO., 14 Maple Ave., Pine Brook, N. J. ADV. PG. 193.
V LAVOIE LABORATORIES, Morganville, N. J. ADV. PG. 151.
Local Electronics Corp., 794 E. 140th St., New York 54, N. Y.
V Manufacturers Engr. & Equip. Corp., Willow Grove, Pa.
V MEASUREMENTS CORP., Boonton, N. J. ADV. PG. 145.
V Oak Ridge Products Mfg. Div. of Video Television Inc., 219 E. 127th St., New York 35, N. Y.
V Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
V POTTER INSTRUMENT CO., INC., 115 Cutter Mill Rd., Great Neck, N. Y. ADV. PG. 204.
V Radar Engineers, 110 University St., Seattle 1, Wash.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
V Tel-Instrument Co., Inc., 50 Paterson Ave., East Rutherford, N. J.
V WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
V Wilmotte Inc., Raymond M., 1469 Church St., N. W., Washington 5, D. C.

GENERATORS—*Ultrasonic*

American Electroneering Co., 2112 S. LaBrea Ave., Los Angeles, Calif.
V BRUSH DEVELOPMENT CO., 3405 Perkins Ave., Cleveland 14, Ohio. ADV. PG. 124, 125.
V CLARK CRYSTAL CO., 2 Farm Rd., Marlboro, Mass. ADV. PG. 210.
Coastwise Electronics Co., Inc., 130 N. Beaudry Ave., Los Angeles, Calif.
V Crystal Research Labs., Inc., 29 Allyn St., Hartford, Conn.
V ELECTRONIC MEASUREMENTS CO., Red Bank, N. J. ADV. PG. 199.
FLADER, INC., FREDERIC, North Tonawanda, N. Y. ADV. PG. 240.
V GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
V GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
V GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
V HEWLETT-PACKARD CO., 395 Page Mill Rd., Palo Alto, Calif. ADV. PG. 68, 69.
V KNIGHTS CO., JAMES, 131 S. Wells St., Sandwich, Ill. ADV. PG. 190.
Local Electronics Corp., 794 E. 140th St., New York 54, N. Y.
V Manufacturers Engr. & Equip. Corp., Willow Grove, Pa.
V Marconi Instruments, Ltd., 23 Beaver St., New York 4, N. Y.
V Massa Laboratories, 3868 Carnegie St., Cleveland, Ohio.
V Penn Products Co., Whitney St., Framingham, Mass.
V RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
V REEVES-HOFFMAN CORP., 321 Cherry St., Carlisle, Pa. ADV. PG. 32.
Short Wave Plastic Forming Co., 2921 W. Almeda St., Burbank, Calif.
V Submarine Signal Div., Raytheon Mfg. Co., Waltham, Mass.
V Vargas Crystals, Highland St., Holliston, Mass.
Westlake Electronics Co., 11660 Olympic Blvd., Los Angeles 25, Calif.

GENERATORS—*Winddriven Generating Equipment*

V Wincharger Corp., E. 7th & Division Sts., Sioux City, Iowa.
V Wind Turbine Co., Tower & Antenna Div., E. Market St. & Penna. R.R., West Chester, Pa.

GENERATORS, SIGNAL—*a-f*

V Altec Lansing Corp., 161 Avenue of the Americas, New York 13, N. Y.
V American Electroneering Co., 2112 S. LaBrea Ave., Los Angeles, Calif.
V ATOMIC INSTRUMENT CO., 160 Charles St., Boston, Mass. ADV. PG. 218.
V BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
V Clarkstan Corp., 11927 S.W. Pico Blvd., Los Angeles 64, Calif.
V Clough Brengle Co., 6014 N. Broadway, Chicago, Ill.
Coastwise Electronics Co., Inc., 130 N. Beaudry Ave., Los Angeles, Calif.
V Collins Radio Co., Cedar Rapids, Iowa.
V Daven Co., 191 Central Ave., Newark 4, N. J.
V ELECTRONIC INSTRUMENT CO., INC., 276 Newport St., Brooklyn 12, N. Y. ADV. PG. 274.
V ELECTRONIC MEASUREMENTS CO., Red Bank, N. J. ADV. PG. 199.
V Electronic Workshop, Inc., 351 Bleecker St., New York 14, N. Y.
V EL-TRONICS, INC., 2649 N. Howard St., Philadelphia 33, Pa. ADV. PG. 238.
V GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
V GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
V HEATH CO., Benton Harbor, Mich. ADV. PG. 279.
V Jackson Electrical Instrument Co., 16 S. Patterson Blvd., Dayton 1, Ohio.
Local Electronics Corp., 794 E. 140th St., New York 54, N. Y.
V Marconi Instruments, Ltd., 23 Beaver St., New York 4, N. Y.
V MEASUREMENTS CORP., Boonton, N. J. ADV. PG. 145.
Metropolitan Electronics & Instruments Co., 106 Fifth Ave., New York 11, N. Y.
V MUIRHEAD & CO., LTD., Beckenham, Kent, England. ADV. PG. 71.
V Oak Ridge Products Mfg. Div. of Video Television Inc., 219 E. 127th St., New York 35, N. Y.
V Philbrick Researches, Inc., George A., 230 Congress St., Boston 10, Mass.
V Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
V Premier Crystal Labs., Inc., 79-89 Seventh Ave., New York 11, N. Y.
V Radio City Products Co., Inc., 152 W. 25th St., New York, N. Y.
V RADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75. Inside Back and Back Covers.
V Reiner Electronics Co., 152 W. 25th St., New York, N. Y.
V Simpson Electric Co., Div. of American Gage & Machine Co., 5200 W. Kinzie St., Chicago 44, Ill.
V Southwestern Industrial Electronic Co., 2831 Post Oak Rd., Houston 19, Texas.
V SYLVANIA ELECTRIC PRODUCTS, INC., Emporium, Pa. ADV. PG. 286 to 290.
V Triumph Mfg. Co., 815 Van Buren St., Chicago 7, Ill.
V Weinschel Engineering Co., 329 William St., New York 7, N. Y.

GENERATORS, SIGNAL—*f-m*

V American Electroneering Co., 2112 S. LaBrea Ave., Los Angeles, Calif.
V BOONTON RADIO CORP., Boonton, N. J. ADV. PG. 107.
Coastwise Electronics Co., Inc., 130 N. Beaudry Ave., Los Angeles, Calif.
Electro Engineering & Mfg. Co., 627 W. Alexandrine, Detroit 2, Mich.
V ELECTRONIC INSTRUMENT CO., INC., 276 Newport St., Brooklyn 12, N. Y. ADV. PG. 274.
V ELECTRONIC MEASUREMENTS CO., Red Bank, N. J. ADV. PG. 274.
V Ferris Instrument Co., 110 Cornelia St., Boonton, N. J.
V GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
V GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
V HEATH CO., Benton Harbor, Mich. ADV. PG. 279.
V HICKOK ELECTRICAL INSTRUMENT CO., 10514 Dupont Ave., Cleveland, Ohio. ADV. PG. 215.
V Jackson Electrical Instrument Co., 16 S. Patterson Blvd., Dayton 1, Ohio.
V KAY ELECTRIC CO., 14 Maple Ave., Pine Brook, N. J. ADV. PG. 193.
McMurdo Silver Co., Inc., 1240 Main St., Hartford 3, Conn.
V Marconi Instruments, Ltd., 23 Beaver St., New York 4, N. Y.
V MEASUREMENTS CORP., Boonton, N. J. ADV. PG. 145.
Metropolitan Electronics & Instruments Co., 106 Fifth Ave., New York 11, N. Y.
V Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Precision Apparatus Co., Inc., 92-27 Horace Harding Blvd., Elmhurst, N. Y.
V Premier Crystal Labs., Inc., 79-89 Seventh Ave., New York 11, N. Y.
V Radio City Products Co., Inc., 152 W. 25th St., New York, N. Y.
V Reiner Electronics Co., 152 W. 25th St., New York, N. Y.
V Simpson Electric Co., Div. of American Gage & Mach. Co., 5200 W. Kinzie St., Chicago 44, Ill.
V SPERRY GYROSCOPE CO., Div. of the Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.
V Superior Instruments Co., 337 Fulton St., New York 7, N. Y.
V SYLVANIA ELECTRIC PRODUCTS, INC., Emporium, Pa. ADV. PG. 286 to 290.
V Triplett Electrical Instrument Co., 286 Harmon Road, Bluffton, Ohio.

GENERATORS, SIGNAL—*r-f*

V Airborne Instruments Lab., Inc., 160 Old Country Rd., Mineola, L. I., N. Y.
V American Electroneering Co., 2112 S. La Brea Ave., Los Angeles, Calif.
V BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
V BOONTON RADIO CORP., Boonton, N. J. ADV. PG. 107.
V Clough Brengle Co., 6014 N. Broadway, Chicago, Ill.
Coastwise Electronics Co., Inc., 130 N. Beaudry Ave., Los Angeles, Calif.
V Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
V Collins Radio Co., Cedar Rapids, Iowa.
V Connor (Canada) Ltd., 301-303 Windsor St., Halifax, N. S., Canada.
V Daven Co., 191 Central Ave., Newark 4, N. J.
Douglas Radio Labs., 40 Wayland St., Boston 25, Mass.
Electro Engineering & Mfg. Co., 627 W. Alexandrine, Detroit 2, Mich.
V EL-TRONICS, INC., 2649 N. Howard St., Philadelphia 33, Pa. ADV. PG. 238.
V ELECTRONIC INSTRUMENT CO., INC., 276 Newport St., Brooklyn 12, N. Y. ADV. PG. 274.
V ELECTRONIC MEASUREMENTS CO., Red Bank, N. J. ADV. PG. 199.
V Feller Engineering Co., 1601 S. Federal St., Chicago 16, Ill.
V Ferris Instrument Co., 110 Cornelia St., Boonton, N. J.
V General Communication Co., 530 Commonwealth Ave., Boston 15, Mass.
V GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
V GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
V HEATH CO., Benton Harbor, Mich. ADV. PG. 279.
V HEWLETT-PACKARD CO., 395 Page Mill Rd., Palo Alto, Calif. ADV. PG. 68, 69.
V HICKOK ELECTRICAL INSTRUMENT CO., 10514 Dupont Ave., Cleveland, Ohio. ADV. PG. 215.
V Jackson Electrical Instrument Co., 16 S. Patterson Blvd., Dayton 1, Ohio.
V KAY ELECTRIC CO., 14 Maple Ave., Pine Brook, N. J. ADV. PG. 193.
V LAVOIE LABORATORIES, Morganville, N. J. ADV. PG. 151.
McMurdo Silver Co., Inc., 1240 Main St., Hartford 3, Conn.
V Marconi Instruments, Ltd., 23 Beaver St., New York 4, N. Y.

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

Ⓥ**WEASUREMENTS CORP.**, Boonton, N. J. ADV. PG. 145.
Metropolitan Electronics & Instruments Co., 106 Fifth Ave., New York 11, N. Y.
Monitor Products Co., 815 Fremont Ave., So. Pasadena, Calif.
Ⓥ Oak Ridge Products Mfg. Div. of Video Television Inc., 239 E. 127th St., New York 35, N. Y.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Precision Apparatus Co., Inc., 92-27 Horace Harding Blvd., Elmhurst, N. Y.
Ⓥ Premier Crystal Labs., Inc., 79-89 Seventh Ave., New York 11, N. Y.
Ⓥ Radio City Products Co., Inc., 152 W. 25th St., New York, N. Y.
Ⓥ **RADIO CORP. OF AMERICA**, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75. Inside Back and Back Covers.
Ⓥ Reiner Electronics Co., 152 W. 25th St., New York, N. Y.
Ⓥ Rollin Co., 2070 N. Fair Oaks Ave., Pasadena 3, Calif.
Ⓥ Simpson Electric Co., Div. of American Gage & Machine Co., 5208 W. Kinzie St., Chicago 44, Ill.
Ⓥ Superior Instruments Co., 337 Fulton St., New York 7, N. Y.
Ⓥ **SYLVANIA ELECTRIC PRODUCTS, INC.**, Emporium, Pa. ADV. PG. 286 to 290.
Ⓥ Technology Instrument Corp., 1058 Main St., Waltham 54, Mass.
Westline Electronics Co., 11660 Olympic Blvd., Los Angeles 25, Calif.

GENERATORS, SIGNAL—*uhf*

Ⓥ American Electroneering Co., 2112 S. La Brea Ave., Los Angeles, Calif.
Ⓥ **BARKER & WILLIAMSON**, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Coastwise Electronics Co., Inc., 130 N. Beaudry Ave., Los Angeles, Calif.
Ⓥ **ELECTRONIC MEASUREMENTS CO.**, Red Bank, N. J. ADV. PG. 139.
Ⓥ Feiler Engineering Co., 1601 S. Federal St., Chicago 16, Ill.
Ⓥ Jackson Electrical Instrument Co., 16 S. Patterson Blvd., Dayton 1, Ohio.
Loral Electronics Corp., 794 E. 140th St., New York 54, N. Y.
Ⓥ **KAY ELECTRIC CO.**, 14 Maple Ave., Pine Brook, N. J. ADV. PG. 193.
Metropolitan Electronics & Instruments Co., 106 Fifth Ave., New York 11, N. Y.
Ⓥ **POLYTECHNIC RESEARCH & DEVELOPMENT CO., INC.**, 202 Tillary St., Brooklyn 1, N. Y. ADV. PG. 56, 57.
Ⓥ Simpson Electric Co., Div. of American Gage & Machine Co., 5208 W. Kinzie St., Chicago 44, Ill.
Ⓥ **SPERRY GYROSCOPE CO.**, Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.

GENERATORS, SIGNAL—*Sweeping*

Ⓥ Canoga Corp., 14315 Bessemer St., P. O. Box 361, Van Nuys, Calif.
Ⓥ Clarkstan Corp., 11927 S. W. Pico Blvd., Los Angeles 64, Calif.
Coastwise Electronics Co., Inc., 130 N. Beaudry Ave., Los Angeles, Calif.
Ⓥ Cossor (Canada) Ltd., 301-303 Windsor St., Halifax, N. S., Canada.
Ⓥ **ELECTRONIC INSTRUMENT CO., INC.**, 276 Newport St., Brooklyn 12, N. Y. ADV. PG. 274.
Ⓥ **ELECTRONIC MEASUREMENTS CO.**, Red Bank, N. J. ADV. PG. 139.
Ⓥ **ELECTRONIC TUBE CORP.**, 1200 E. Mermaid Lane, Philadelphia 18, Pa. ADV. PG. 156.
Ⓥ Feiler Engineering Co., 1601 S. Federal St., Chicago 16, Ill.
Ⓥ **GENERAL ELECTRIC CO.**, Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
Ⓥ **HARVEY RADIO LABS., INC.**, 447 Concord Ave., Cambridge, Mass. ADV. PG. 104.
Ⓥ **HEATH CO.**, Benton Harbor, Mich. ADV. PG. 279.
Ⓥ **HICKOK ELECTRICAL INSTRUMENT CO.**, 10514 Dupont Ave., Cleveland, Ohio. ADV. PG. 215.
Ⓥ Jackson Electrical Instrument Co., 16 S. Patterson Blvd., Dayton 1, Ohio.
Ⓥ **KAY ELECTRIC CO.**, 14 Maple Ave., Pine Brook, N. J. ADV. PG. 193.
Ⓥ Manufacturers Engr. & Equip. Corp., Willow Grove, Pa.
Ⓥ Marconi Instrument Ltd., 23 Beaver St., New York 4, N. Y.
Metropolitan Electronics & Instruments Co., 106 Fifth Ave., New York 11, N. Y.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ **POLYTECHNIC RESEARCH & DEVELOPMENT CO., INC.**, 202 Tillary St., Brooklyn 1, N. Y. ADV. PG. 56, 57.
Precision Apparatus Co., Inc., 92-27 Horace Harding Blvd., Elmhurst, N. Y.
Ⓥ Precision Electronics, 641 Milwaukee Ave., Chicago 22, Ill.
Ⓥ Radio City Products Co., Inc., 152 W. 25th St., New York 1, N. Y.
Ⓥ **RADIO CORP. OF AMERICA**, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75. Inside Back and Back Covers.
Ⓥ Reiner Electronic Co., 152 W. 25th St., New York 1, N. Y.
Ⓥ Simpson Electric Co., Div. of American Gage & Machine Co., 5208 W. Kinzie St., Chicago 44, Ill.
Ⓥ **SPERRY GYROSCOPE CO.**, Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.
Ⓥ Superior Instruments Co., 337 Fulton St., New York 7, N. Y.
Ⓥ **SYLVANIA ELECTRIC PRODUCTS, INC.**, Emporium, Pa. ADV. PG. 286 to 290.
Ⓥ Tel-Instrument Co., Inc., 50 Paterson Ave., East Rutherford, N. J.
Ⓥ **WATERMAN PRODUCTS CO., INC.**, 2445-63 Emerald St., Philadelphia 25, Pa. ADV. PG. 252.

GENERATORS, SIGNAL—*Television Synchronizing*

Ⓥ **ELECTRONIC INSTRUMENT CO., INC.**, 276 Newport St., Brooklyn 12, N. Y. ADV. PG. 274.
Ⓥ **ELECTRONIC MEASUREMENTS CO.**, Red Bank, N. J. ADV. PG. 139.
Ⓥ Federal Engineering Co., 37 Murray St., New York 7, N. Y.
Ⓥ Feiler Engineering Co., 1601 S. Federal St., Chicago 16, Ill.
Ⓥ **GENERAL ELECTRIC CO.**, Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
Ⓥ **HEWLETT-PACKARD CO.**, 395 Page Mill Rd., Palo Alto, Calif. ADV. PG. 68, 69.
Ⓥ **HICKOK ELECTRICAL INSTRUMENT CO.**, 10514 Dupont Ave., Cleveland, Ohio. ADV. PG. 215.
Ⓥ Jackson Electrical Instrument Co., 16 S. Patterson Blvd., Dayton 1, Ohio.
Jamaica Television Mfg. Co., 95-26 Sutphin Blvd., Jamaica 4, N. Y.
Ⓥ **MEASUREMENTS CORP.**, Boonton, N. J. ADV. PG. 145.
Metropolitan Electronics & Instruments Co., 106 Fifth Ave., New York 11, N. Y.
Ⓥ Polarad Electronics Corp., 100 Metropolitan Ave., Brooklyn 11, N. Y.
Ⓥ **RADIO CORP. OF AMERICA**, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75. Inside Back and Back Covers.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ Simpson Electric Co., Div. of American Gage & Machine Co., 5208 W. Kinzie St., Chicago 44, Ill.
Ⓥ Superior Instruments Co., 337 Fulton St., New York 7, N. Y.
Telequip Radio Co., 1901 S. Washtenaw, Chicago, Ill.
Ⓥ Television Equipment Corp., 238 William St., New York 7, N. Y.
Television Projects, Inc., 3660 Coral Way, Miami 34, Fla.
Ⓥ Tel-Instrument Co., Inc., 50 Paterson Ave., East Rutherford, N. J.

GENERATORS, SIGNAL—*uhf*

Ⓥ **AIRCRAFT RADIO CORP.**, Boonton, N. J. ADV. PG. 198, 199.
Ⓥ American Electroneering Co., 2112 S. La Brea Ave., Los Angeles, Calif.
Ⓥ **BROWNING LABS., INC.**, 750 Main St., Winchester, Mass. ADV. PG. 30.
Electro Engineering & Mfg. Co., 627 W. Alexandrine, Detroit 1, Mich.
Ⓥ **ELECTRONIC MEASUREMENTS CO.**, Red Bank, N. J. ADV. PG. 139.
Ⓥ Feiler Engineering Co., 1601 S. Federal St., Chicago 16, Ill.
Ⓥ Ferris Instrument Co., 110 Cornelia St., Boonton, N. J.
Ⓥ General Communication Co., 530 Commonwealth Ave., Boston 15, Mass.
Ⓥ **GENERAL ELECTRIC CO.**, Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
Ⓥ **GENERAL RADIO CO.**, 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Ⓥ **HEWLETT-PACKARD CO.**, 395 Page Mill Rd., Palo Alto, Calif. ADV. PG. 68, 69.
Ⓥ **KAY ELECTRIC CO.**, 14 Maple Ave., Pine Brook, N. J. ADV. PG. 193.
Ⓥ **LAVOIE LABORATORIES**, Morganville, N. J. ADV. PG. 151.
Loral Electronics Corp., 794 E. 140th St., New York 54, N. Y.
McMurdo Silver Co., Inc., 1240 Main St., Hartford 3, Conn.
Ⓥ Marconi Instruments, Ltd., 23 Beaver St., New York 4, N. Y.
Ⓥ **MEASUREMENTS CORP.**, Boonton, N. J. ADV. PG. 145.
Metropolitan Electronics & Instruments Co., 106 Fifth Ave., New York 11, N. Y.
Ⓥ **POLYTECHNIC RESEARCH & DEVELOPMENT CO., INC.**, 202 Tillary St., Brooklyn 1, N. Y. ADV. PG. 56, 57.
Ⓥ Rollin Co., 2070 N. Fair Oaks Ave., Pasadena 3, Calif.
Ⓥ Simpson Electric Co., Div. of American Gage & Machine Co., 5408 W. Kinzie St., Chicago 44, Ill.
Ⓥ **SPERRY GYROSCOPE CO.**, Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.
Ⓥ Superior Instruments Co., 337 Fulton St., New York 7, N. Y.
Westline Electronics Co., 11660 Olympic Blvd., Los Angeles 25, Calif.

GENERATORS, SIGNAL—*vhf*

Ⓥ Airborne Instruments Lab., Inc., 160 Old Country Road, Mineola, N. Y.
Ⓥ American Electroneering Co., 2112 S. LaBrea Ave., Los Angeles, Calif.
Ⓥ **BOONTON RADIO CORP.**, Boonton, N. J. ADV. PG. 107.
Ⓥ Collins Radio Co., Cedar Rapids, Iowa.
Electro Engineering & Mfg. Co., 627 W. Alexandrine, Detroit 1, Mich.
Ⓥ **ELECTRONIC MEASUREMENTS CO.**, Red Bank, N. J. ADV. PG. 139.
Ⓥ Feiler Engineering Co., 1601 S. Federal St., Chicago 16, Ill.
Ⓥ Ferris Instrument Co., 110 Cornelia St., Boonton, N. J.
Ⓥ General Communication Co., 530 Commonwealth Ave., Boston 15, Mass.
Ⓥ **GENERAL ELECTRIC CO.**, Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
Ⓥ **GENERAL RADIO CO.**, 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Ⓥ **HEWLETT-PACKARD CO.**, 395 Page Mill Rd., Palo Alto, Calif. ADV. PG. 68, 69.
Ⓥ Jackson Electrical Instrument Co., 16 S. Patterson Blvd., Dayton 1, Ohio.
Ⓥ **KAY ELECTRIC CO.**, 14 Maple Ave., Pine Brook, N. J. ADV. PG. 193.
Ⓥ **LAVOIE LABORATORIES**, Morganville, N. J. ADV. PG. 151.
Loral Electronics Corp., 794 E. 140th St., New York 54, N. Y.
McMurdo Silver Co., Inc., 1240 Main St., Hartford 3, Conn.
Ⓥ Marconi Instruments, Ltd., 23 Beaver St., New York 4, N. Y.
Ⓥ **MEASUREMENTS CORP.**, Boonton, New Jersey. ADV. PG. 145.
Ⓥ Philbrick Researches, Inc., George A., 230 Congress St., Boston 10, Mass.
Ⓥ **POTTER INSTRUMENT CO., INC.**, 115 Cutter Mill Rd., Great Neck, N. Y. ADV. PG. 204.
Ⓥ **RADIO CORP. OF AMERICA**, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75. Inside Back and Back Covers.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.

GENERATORS—*Square Wave*

American Electroneering Co., 2112 S. LaBrea Ave., Los Angeles, Calif.
Ⓥ **BARKER & WILLIAMSON**, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ Central Scientific Co., 1700 Irving Park Rd., Chicago 13, Ill.
Coastwise Electronics Co., Inc., 130 N. Beaudry Ave., Los Angeles, Calif.
Ⓥ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ DuMont Laboratories, Inc., Allen B., Instrument Div., 1000 Main Ave., Clifton, N. J.
Ⓥ **ELECTRONIC MEASUREMENTS CO.**, Red Bank, N. J. ADV. PG. 139.
Ⓥ **EL-TRONICS, INC.**, 2649 N. Howard St., Philadelphia 33, Pa. ADV. PG. 238.
FLADER INC., FREDERIC, North Tonawanda, N. Y. ADV. PG. 240.
Ⓥ **GENERAL ELECTRIC CO.**, Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
Ⓥ **GENERAL RADIO CO.**, 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Ⓥ Globe Products Corp., P. O. Box 197, Southport, Conn.
Ⓥ **HEATH CO.**, Benton Harbor, Mich. ADV. PG. 279.
Ⓥ **HEWLETT-PACKARD CO.**, 395 Page Mill Rd., Palo Alto, Calif. ADV. PG. 68, 69.
Jamaica Television Mfg. Co., 95-26 Sutphin Blvd., Jamaica 4, N. Y.
Ⓥ **KAY ELECTRIC CO.**, 14 Maple Ave., Pine Brook, N. J. ADV. PG. 193.
Ⓥ **LAVOIE LABORATORIES**, Morganville, N. J. ADV. PG. 151.
Loral Electronics Corp., 794 E. 140th St., New York 54, N. Y.
Ⓥ Marconi Instruments, Ltd., 23 Beaver St., New York 4, N. Y.
Ⓥ **MEASUREMENTS CORP.**, Boonton, New Jersey. ADV. PG. 145.
Ⓥ Philbrick Researches, Inc., George A., 230 Congress St., Boston 10, Mass.
Ⓥ **POTTER INSTRUMENT CO., INC.**, 115 Cutter Mill Rd., Great Neck, N. Y. ADV. PG. 204.
Ⓥ **RADIO CORP. OF AMERICA**, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75. Inside Back and Back Covers.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.

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Ⓜ SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.
Ⓜ Tektronix, Inc., 712 S. E. Hawthorne Blvd., Portland 14, Ore.

GEOPHYSICAL APPARATUS

Ⓜ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓜ CENTURY GEOPHYSICAL CORP., 1333 N. Utica, Tulsa 3, Oklahoma. ADV. PG. 237.
Ⓜ Dawe Co., 191 Central Ave., Newark 4, N. J.
Engineering Lab., Inc., 602 E. 4th St., Tulsa 3, Okla.
Ⓜ Engineering Research Corp., Shreveport, La.
Ⓜ Geophysical Instrument Co., 1820 N. Nash St., Arlington, Va.
Globe Phone Mfg. Co., 2 Linden St., Reading, Mass.
Ⓜ Hastings Instrument Co., Box 1275, Hampton, Va.
Ⓜ Hathaway Instrument Co., 1315 S. Clarkson St., Denver 10, Colo.
Ⓜ Hogan Laboratories, Inc., 155 Perry St., New York 14, N. Y.
Ⓜ KAY ELECTRIC CO., 14 Maple Ave., Pine Brook, N. J. ADV. PG. 193.
Ⓜ Southwestern Industrial Electronic Co., 2831 Post Oak Rd., Houston 19, Texas.
Ⓜ Special Instruments Laboratory, Inc., 1005 Highland Ave., Knoxville, Tenn.
Ⓜ Varo Mfg. Co., Inc., Box 638, Garland, Texas.
Ⓜ Z & W Machine Products Inc., Electronics Div., 5151 St. Clair Ave., Cleveland 3, Ohio.

GETTERS

See Tube Parts

GLASS

See Insulation Materials

GLASS BONDED MICA

See Insulation Materials

GLASS FIBRE

See Insulation Materials

GLASS—*Metal-to-Glass Seals*

See SEALS—Metal-to-Glass

GRAPHIC RECORDING INSTRUMENTS

See Instruments, Graphic Recording

GRAPHITE—*Colloidal*

Ⓜ Acheson Colloids Corp., Port Huron, Mich.
Ⓜ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
Ⓜ Graphite Colloids Corp., Sharon, Pa.
Superior Flake Graphite Co., 35 S. Clark St., Chicago 3, Ill.

GRIDS AND GRID SUPPORTS

See Tube Parts

GRILLES—*Metal*

Ⓜ Acklin Stamping Co., 1913 Nebraska Ave., Toledo 7, Ohio.
Ⓜ Barber-Colman Co., Rockford, Ill.
Ⓜ Bentonart Products, 14 Delaney St., New York, N. Y.
Ⓜ Bud Radio, Inc., 2118 E. 55th St., Cleveland 4, Ohio.
Ⓜ Chase Brass & Copper Co., Inc., Waterbury 91, Conn.
Ⓜ Cinaudagraph Corp., 3701 Rosenwald St., Chicago 47, Ill.
Ⓜ INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
Ⓜ MULTI METAL WIRE CLOTH CO., INC., 1310 Garrison Ave., New York 59, N. Y. ADV. PG. no.
ADV. Mfg. Corp., Jericho Turnpike, Mineola, N. Y.
Ⓜ Schott Co., Walter L., 9306 Santa Monica Blvd., Beverly Hills, Calif.
Ⓜ Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp., 500 Fifth Ave., New York 18, N. Y.

GRILLES—*Molded Plastic*

American Communications Corp., 306 Broadway, New York 7, N. Y.
American Insulator Corp., New Freedom, Pa.
Boynton Molding Co., Boonton, N. J.
Ⓜ Chicago Die Mold Mfg. Co., 4001 Wrightwood Ave., Chicago 39, Ill.
Ⓜ Chemical Co., Inc., The, 1239 Central Ave., Hillside 5, N. J.
Felsenthal & Sons, Inc., G., 4100 W. Grand Ave., Chicago 51, Ill.
Kirk Molding Corp., 4600 W. Huron St., Chicago 44, Ill.
Insulation Mfg. Co., 11 New York Ave., Brooklyn, N. Y.
Ⓜ Molded Insulation Co., Aircraft Control Div., 335 E. Price St., Philadelphia, Pa.
Ⓜ RICHARDSON CO., THE, 2767 Lake St., Melrose Park, Ill. ADV. PG. 144.
Spaulding Fibre Co., Inc., 310 Wheeler St., Tonawanda, N. Y.
Ⓜ Waterbury Companies, Inc., Waterbury 90, Conn.

GRILLES—*Speaker*

Ⓜ Cinaudagraph Speakers Inc., Div. of Airex Mfg. Corp., 1401 Fairfax Trafficway, Kansas City, Kansas.
Feisenthal & Sons, Inc., G., 4100 W. Grand Ave., Chicago 51, Ill.

GROMMETS

Ⓜ AEROLITE ELECTRONIC HARDWARE CORP., 507 26th St., Union City, N. J. ADV. PG. 136.
Ⓜ AMERICAN LAVA CORP., Chattanooga 5, Tenn. ADV. PG. 27.
Ⓜ ATLANTIC INDIA RUBBER WORKS, INC., 571 W. Polk St., Chicago 7, Ill. ADV. PG. 271.
Beach Precision Parts Co., Boonton, N. J.
Carby Mfg. Co., Inc., 62 Cottage Place, Waterbury 5, Conn.
Ⓜ Chase Brass & Copper Co., Inc., Waterbury 91, Conn.
Ⓜ Dzus Fastener Co., Inc., Box 785, Babylon, N. Y.
Ⓜ FEDERAL SCREW PRODUCTS, INC., 224 W. Huron St., Chicago 10, Ill. ADV. PG. 271.
Ⓜ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
Ⓜ General Tire & Rubber Co., The, Silentbloc Div., Wabash, Ind.
Ⓜ INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
Ⓜ J F D MFG. CO., 6101-23 Sixteenth Ave., Brooklyn, N. Y. ADV. PG. 254, 264.
Ⓜ Judd Co., H. L., 87 Chambers St., New York 7, N. Y.
Ⓜ Lamicoid Fabricators, Inc., 4545 W. Cortland St., Chicago 39, Ill.
Ⓜ Mayfair Molded Products Corp., 4440 N. Elston Ave., Chicago 30, Ill.
Ⓜ Maxsy, Inc., Arlington Heights Airport, Arlington Heights, Ill.
Ⓜ Oak Ridge Products Mfg. Div. of Video Television, Inc., 239 E. 127th St., New York 35, N. Y.
Ⓜ Schutt Co., Walter L., 9306 Santa Monica Blvd., Beverly Hills, Calif.
Ⓜ Scovill Mfg. Co., Industrial Fastener Div., Waterbury, Conn.
Ⓜ Smith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.
Ⓜ Stimpson Co., Inc., Edwin B., 74 Franklin Ave., Brooklyn 5, N. Y.
Ⓜ United Carr Fastener Corp., Cambridge 42, Mass.
Ⓜ U. S. Rubber Co., 1230 Avenue of the Americas, New York 20, N. Y.
Ⓜ United Shoe Machinery Corp., 142 Federal St., Boston, Mass.
Ⓜ Vaillorbs Jewel Co., Lancaster, Pa.
Ⓜ Waterbury Companies, Inc., Waterbury 90, Conn.

GROMMETS—*Fibre*

Beach Precision Parts Co., Boonton, N. J.
Brandywine Fibre Co., 15th & Poplar Sts., Wilmington, Del.
Ⓜ Continental Diamond Fibre Co., 16 Chapel St., Newark 16, Delaware.
Ⓜ FEDERAL SCREW PRODUCTS INC., 224 W. Huron St., Chicago 10, Ill. ADV. PG. 271.
Ⓜ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
Ⓜ Lamicoid Fabricators, Inc., 4545 W. Cortland St., Chicago 39, Ill.
Ⓜ NATIONAL VULCANIZED FIBRE CO., Wilmington, Del. ADV. PG. 181.
Spaulding Fibre Co., Inc., 310 Wheeler St., Tonawanda, N. Y.
Ⓜ Taylor Fibre Co., Norristown, Pa.

GUIDES—*Coil Wind*

Ⓜ AMERICAN LAVA CORP., Chattanooga 5, Tenn. ADV. PG. 27.
Ⓜ Stolle Engineering & Mfg. Co., 3970 S. Grand Ave., Los Angeles 37, Calif.
Ⓜ Woburn Instrument Co., 1940 Commercial St., East Weymouth 89, Mass.

HARNESSES—*Wire*

See Also Cable Assemblies

Aeronautical Radio Mfg. Co., 155 First St., Mineola, N. Y.
Ⓜ ALDEN PRODUCTS CO., 117 No. Main St., Brockton 64, Mass. ADV. PG. 235.
American Communications Corp., 306 Broadway, New York 7, N. Y.
Ⓜ AMERICAN PHENOLIC CORPORATION, 1830 S. 54th Ave., Chicago 50, Ill. ADV. PG. 141.
Ⓜ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓜ Belden Mfg. Co., 4649 W. Van Buren St., Chicago 44, Ill.
Ⓜ Bramston Electric Mfg. Co., Inc., 62-65 Gill Pl., Buffalo 22, N. Y.
Ⓜ Carol Cable Co., 190 Middle St., Pawtucket, R. I.
Ⓜ Citation Products Co., 233 E. 146th St., New York 51, N. Y.
Cole-Hersee Co., 20 Old Colony Ave., Boston 27, Mass.
Ⓜ Columbia Wire & Supply Co., 2850 Irving Park Rd., Chicago 18, Ill.
Ⓜ Connecticut Telephone & Electric Div., Great American Industries Inc., 70 Britannia St., Meriden, Conn.
Ⓜ Consolidated Wire & Associated Companies, 1635 S. Clinton St., Chicago 16, Ill.
Ⓜ CORNISH WIRE CO., 15 Park Row, New York 7, N. Y. ADV. PG. 140.
Ⓜ Dielectric Materials Co., 5315-17 N. Ravenswood Ave., Chicago 40, Ill.
Ⓜ Eastern Specialty Co., Philadelphia 40, Pa.
Eby Inc., Hugh H., 4700 Stenton Ave., Philadelphia 44, Pa.
Ⓜ Electric Auto-Lite Co., The, Toledo 1, Ohio.
Ⓜ ELECTRO-WIRE SERVICE, 5 Beeckman St., New York 7, N. Y. ADV. PG. 269.
Electronic Brazing Co., 146 Glenridge Ave., Montclair, N. J.
Ⓜ Essex Wire Corp., 1601 Wall St., Fort Wayne 6, Ind.
Ⓜ Fenaco Mfg. Co., Inc., Woods Church Rd., Flemington, N. J.
Ⓜ Franklin Mfg. Corp., A. W., 43-20 34th St., Long Island City 1, N. Y.
Ⓜ Haft & Sons, Inc., 79 Third St., Brooklyn 31, N. Y.
Ⓜ Hallett Mfg. Co., 1601 Florence Ave., Inglewood, Calif.
Ⓜ Industrial Electronics Co., Inc., Hanover, Mass.
Ⓜ INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
Ⓜ J F D MFG. CO., 6101-23 Sixteenth Ave., Brooklyn, N. Y. ADV. PG. 254, 264.
Ⓜ Kulka Electric Mfg. Co., Inc., 30 South St., Mt. Vernon, N. Y.
Loral Electronics Corp., 794 E. 140th St., New York 54, N. Y.
MacLeod & Hanopol, 10 Joiner St., Charlestown 29, Mass.
Molded Insulation Co., Aircraft Control Div., 335 E. Price St., Philadelphia, Pa.
Ⓜ Pacific Electricord Co., P. O. 1260, Beverly Hills, Calif.
Ⓜ Oak Ridge Products Mfg. Div. of Video Television, Inc., 239 E. 127th St., New York 35, N. Y.
Ⓜ PHALO PLASTICS CORP., 25 Foster St., Worcester 8, Mass. ADV. PG. 212.
Ⓜ Plastoid Corp., 10 Mill Rd., Hamburg, N. J.
Ⓜ Product Development Co., Inc., Arlington, N. J.
Reier Mfg. Co., Hagerstown, Md.
Ⓜ Scintilla Magneto Div. of Bendix Aviation Corp., Sidney, N. Y.
Selectar Industries, Inc., 401 E. 138th St., New York 54, N. Y.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Smith Mfg. Co., Nathan R., 105 Pasadena Ave., S., Pasadena, Calif.
Smykker & Co., Inc., A. F., 202 Tillary St., Brooklyn 1, N. Y.
Star Measurements Co., 442 E. 166th St., New York 56, N. Y.
Ⓜ SURPRENANT MFG. CO., 199 Washington St., Boston 10, Mass. ADV. PG. 229.
Taybern Equipment Co., Inc., 120 Greenwich St., New York 6, N. Y.
Ⓜ Wade Electric Products Co., 211 Jacob St., Sturgis, Mich.
Ⓜ Whittaker Cable Corp., Kansas City 16, Mo.
Ⓜ Z & W Machine Products Inc., Electronics Div., 5151 St. Clair Ave., Cleveland 3, Ohio.

HEADPHONES & HEADSETS

American Electroneering Co., 2112 S. La Brea Ave., Los Angeles, Calif.
Ⓜ AVIOMETER DIV. of Roanwell Corp., 602 Pacific St., Brooklyn 17, N. Y. ADV. PG. 66.
Ⓜ Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.
Ⓜ BRUSH DEVELOPMENT CO., 3405 Perkins Ave., Cleveland 14, Ohio. ADV. PG. 124, 125.
Ⓜ Cannon Co., C. F., Springwater, N. Y.
Ⓜ Carron Mfg. Co., 415 S. Aberdeen St., Chicago, Ill.
Ⓜ Connecticut Telephone & Electric Div., Great American Industries, Inc., 70 Britannia St., Meriden, Conn.
Ⓜ Maurer, Inc., J. A., 37-01 31st St., Long Island City, N. Y.
Ⓜ Mitchell Industries, Inc., Camp Wolters, Mineral Wells, Texas.
Ⓜ Murdock Mfg. Co., Wm. J., Chelsea, Mass.
Ⓜ Permoflux Corp., 4900 W. Grand Ave., Chicago 39, Ill.
Ⓜ Philmore Mfg. Co., 113 University Place, New York 3, N. Y.
Ⓜ Speak-O-Phone Recording & Equipment Co., 23 W. 60th St., New York, N. Y.
Ⓜ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Taybern Equipment Co., Inc., 120 Greenwich St., New York 6, N. Y.
Ⓜ Telex, Inc., Telex Park, St. Paul 1, Minn.
Telephonics Corp., Park Ave., Huntington, N. Y.

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Ⓥ**TRIMM, INC.**, 400 W. Lake St., Libertyville, Ill. ADV. PG. 266.
Ⓥ**Zenith Radio Corp.**, 6001 Dickens Ave., Chicago 39, Ill.

HEADS—*Recording*

Ⓥ**Amplifier Corp. of America**, 396 Broadway, New York 13, N. Y.
Ⓥ**Astatic Corp., The**, Conneaut, Ohio.
Ⓥ**Berlant Associates**, 4917 W. Jefferson Blvd., Los Angeles 16, Calif.
Ⓥ**BRUSH DEVELOPMENT CO.**, 3405 Perkins Ave., Cleveland 14, Ohio. ADV. PG. 124, 125.
Ⓥ**Cook Laboratories**, 139 Gordon Blvd., Floral Park, N. Y.
Ⓥ**Fairchild Recording Equipment Corp.**, 154th St. & 7th Ave., Whitestone, N. Y.
Hart & Co., Inc., Frederick, 839 Main Ave., Poughkeepsie, N. Y.
Ⓥ**INDIANA STEEL PRODUCTS COMPANY, THE**, Valparaiso, Indiana. ADV. PG. 22.
Ⓥ**Speak-O-Phone Recording & Equipment Co.**, 23 W. 60th St., New York, N. Y.
Ⓥ**Stancil-Hoffman Corp.**, 1016 N. Highland Ave., Hollywood 38, Calif.
Ⓥ**Wireway Corp. of America**, 1331 Halsey St., Brooklyn 27, N. Y.

HEARING AID ANALYZERS

Ⓥ**Hofmann Corp., C. L.**, 436 Blvd. of Allies, Pittsburgh, Pa.
Ⓥ**International Instruments, Inc.**, 331 East St., New Haven 11, Conn.
Ⓥ**Massa Laboratories**, 3868 Carnegie St., Cleveland, Ohio.
Ⓥ**PANORAMIC RADIO PRODUCTS, INC.**, 10 South Second Ave., Mt. Vernon, N. Y. ADV. PG. 270.
Ⓥ**Tech Laboratories, Inc.**, Bergen & Edsall Blvds., Palisades Park, N. J.

HEARING AID BATTERIES

Ⓥ**General Dry Batteries, Inc.**, 13000 Athens Ave., Cleveland, Ohio.
Globe Phone Mfg. Co., 2 Linden St., Reading, Mass.
Ⓥ**Manufacturers Battery Co.**, Sub. of Ray-O-Vac Co., Madison, Wis.
Ⓥ**Marathon Battery Co.**, Wausau, Wis.
Ⓥ**NATIONAL CARBON DIVISION**, Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y. ADV. PG. 109.
Ⓥ**Olin Industries, Inc., Electrical Div.**, New Haven 4, Conn.
Ⓥ**Sprague Electric Co.**, North Adams, Mass.
Ⓥ**Vitamite Co.**, 227 W. 64th St., New York 23, N. Y.

HEARING AID CHOKES

Ⓥ**Aurex Corp.**, 1117 N. Franklin St., Chicago, Ill.
Ⓥ**BOND ELECTRONICS CORP.**, 88 Franklin Place, Summit, N. J. ADV. PG. 250.
Ⓥ**ELECTRONIC TRANSFORMER CO., INC.**, 215 W. 25th St., New York, N. Y. ADV. PG. 116.
Ⓥ**FREED TRANSFORMER CO., INC.**, 1736 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 194.
Ⓥ**HIGHLAND ENGINEERING CO.**, 32 Holman Blvd., Hicksville, N. Y. ADV. PG. 194.
Ⓥ**Hofmann Corp., C. L.**, 436 Blvd. of Allies, Pittsburgh, Pa.
Ⓥ**S. N. C. Mfg. Co., Inc.**, Box 277, Oshkosh, Wis.
Ⓥ**Southwestern Industrial Electronic Co.**, 2831 Post Oak Rd., Houston 19, Texas.
Ⓥ**STANDARD TRANSFORMER CORP.**, Elston, Kedzie & Addison, Chicago 18, Ill. ADV. PG. 62.
Ⓥ**Stolle Engineering & Mfg. Co.**, 3970 S. Grand Ave., Los Angeles 37, Calif.
Ⓥ**Super Electric Products Corp.**, 46 Oliver St., Newark, N. J.
Ⓥ**U. S. ELECTRONICS CORP.**, 276 Warren St., Lyndhurst, N. J. ADV. PG. 206.

HEARING AID CONNECTORS

Ⓥ**ALDEN PRODUCTS CO.**, 117 No. Main St., Brockton 64, Mass. ADV. PG. 235.
Ⓥ**Aurex Corp.**, 1117 N. Franklin St., Chicago, Ill.
Ⓥ**BRUSH DEVELOPMENT CO., THE**, 3405 Perkins Ave., Cleveland 14, Ohio. ADV. PG. 124, 125.
Eby, Inc., Hugh H., 4700 Stenton Ave., Philadelphia 44, Pa.
Ⓥ**Etrals Mfg. Co., Inc.**, Woods Church Rd., Flemington, N. J.
Ⓥ**Hofmann Corp., C. L.**, 436 Blvd. of Allies, Pittsburgh, Pa.

HEARING AID MICROPHONES

Ⓥ**Astatic Corp., The**, Conneaut, Ohio.
Ⓥ**BRUSH DEVELOPMENT CO., THE**, 3405 Perkins Ave., Cleveland 14, Ohio. ADV. PG. 124, 125.
Globe Phone Mfg. Co., 2 Linden St., Reading, Mass.
Tibbetts Industries, Inc., Camden, Maine.
Ⓥ**TURNER CO., THE**, 909 17th St., N. E., Cedar Rapids, Iowa. ADV. PG. 54.

HEARING AID RECEIVERS

Ⓥ**Beltone Hearing Aid Co.**, Beltone Bldg., 1450 W. 19th St., Chicago 8, Ill.
BRUSH DEVELOPMENT CO., 3405 Perkins Ave., Cleveland 14, Ohio. ADV. PG. 124, 125.
Ⓥ**CENTRALAB DIV. OF GLOBE UNION INC.**, 900 E. Keefe Ave., Milwaukee, Wis. ADV. PG. 64, 65.
Globe Phone Mfg. Co., 2 Linden St., Reading, Mass.
Ⓥ**Murdock Mfg. Co., Wm. J.**, Chelsea, Mass.
Taybern Equipment Co., Inc., 120 Greenwich St., New York 6, N. Y.
Ⓥ**Telex, Inc.**, Telex Park, St. Paul 1, Minn.

HEARING AID TRANSFORMERS

Ⓥ**Altec Lansing Corp.**, 161 Avenue of the Americas, New York 13, N. Y.
Ⓥ**Aurex Corp.**, 1117 N. Franklin St., Chicago, Ill.
Ⓥ**BOND ELECTRONICS CORP.**, 88 Franklin Place, Summit, N. J. ADV. PG. 250.
Ⓥ**ELECTRONIC TRANSFORMER CO., INC.**, 215 W. 25th St., New York, N. Y. ADV. PG. 116.
Ⓥ**FREED TRANSFORMER CO., INC.**, 1736 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 143.
Ⓥ**HIGHLAND ENGINEERING CO.**, 32 Holman Blvd., Hicksville, N. Y. ADV. PG. 194.
Peerless Electrical Products Co., 6920 McKinley Ave., Los Angeles 1, Calif.
Rollan Electrical Co., 8020 S. South Park, Chicago, Ill.
Ⓥ**S. N. C. Mfg. Co., Inc.**, Box 277, Oshkosh, Wis.
Ⓥ**Southwestern Industrial Electronic Co.**, 2831 Post Oak Rd., Houston 19, Texas.
Standard Electrical Products Co., 402 E. 1st St., Dayton, Ohio.
Ⓥ**STANDARD TRANSFORMER CORP.**, Elston, Kedzie & Addison, Chicago 18, Ill. ADV. PG. 62.
Ⓥ**Stolle Engineering & Mfg. Co.**, 3970 S. Grand Ave., Los Angeles 37, Calif.
Ⓥ**Super Electric Products Corp.**, 46 Oliver St., Newark, N. J.
Ⓥ**Triad Transformer Mfg. Co.**, 2254 Sepulveda Blvd., Los Angeles 64, Calif.

HEARING AID TUBES

See Tubes—Hearing Aid

HEARING AIDS

Ⓥ**Aurex Corp.**, 1117 N. Franklin St., Chicago, Ill.
Ⓥ**Beltone Hearing Aid Co.**, Beltone Bldg., 1450 W. 19th St., Chicago 8, Ill.
Globe Phone Mfg. Corp., 2 Linden St., Reading, Mass.
Ⓥ**Hofmann Corp., C. L.**, 436 Blvd. of The Allies, Pittsburgh 19, Pa.
Ⓥ**Lauretk Radio Mfg. Co.**, 3931 Monroe Ave., Wayne, Mich.
Ⓥ**Malco Co., Inc.**, 21 North 3rd St., Minneapolis, Minn.
Ⓥ**Modern Hearing Aids Laboratory, The**, 6805 Fraser St., Vancouver, B. C., Canada.
Ⓥ**Myers & Sons, E. A., Radiobear Bldg.**, Beverly Rd., Pittsburgh 16, Pa.
Ⓥ**Paravox, Inc.**, 2056 East 4th St., Cleveland 15, Ohio.
Plastics & Electronics Co., 272 Northland Ave., Buffalo 9, N. Y.
Schulmerich Electronics, Inc., Sellersville, Pa.
Smuckler & Co., Inc., A. F., 292 Tillary St., Brooklyn 1, N. Y.
Ⓥ**Sonotone Corp.**, P. O. Box 200, Saw Mill River Road, Elmsford, N. Y.
Taybern Equipment Co., Inc., 120 Greenwich St., New York 6, N. Y.
Ⓥ**Telex, Inc.**, Telex Park, St. Paul 1, Minn.
Ⓥ**TRIMM INC.**, 400 W. Lake St., Libertyville, Ill. ADV. PG. 266.
Western Sound & Electric Labs., Inc., 805 S. Fifth St., Milwaukee 4, Wis.
Z & W Machine Products, Inc., Electronics Div., 5151 St. Clair Ave., Cleveland 3, Ohio.
Ⓥ**Zenith Radio Corp.**, 6001 Dickens Ave., Chicago 39, Ill.

HEATING, ELECTRONIC—*Accessories and Associated Equipment*

Ⓥ**Ajax Electrothermic Corp.**, Ajax Park, Trenton 5, N. J.
Ⓥ**BARKER & WILLIAMSON**, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ**Electronic Engineering Corp.**, 624 Ridge Rd., Lyndhurst, N. J.
Ⓥ**GENERAL ELECTRIC CO.**, Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ**High Frequency Heating Co.**, 143 Glen Park Ave., Gary, Ind.
Ⓥ**Induction Heating Corp.**, 181 Wythe Ave., Brooklyn 11, N. Y.
Ⓥ**INTERNATIONAL RESISTANCE CO.**, 401 N. Broad St., Philadelphia 8, Pa. ADV. PG. 88, 89.
Ⓥ**Lepel High Frequency Labs., Inc.**, 39 West 60th St., New York 23, N. Y.
Ⓥ**Minneapolis-Honeywell Regulator Co.**, 2753 4th Ave., S., Minneapolis, Minn.
Ⓥ**RADIO RECEPTOR CO.**, 251 W. 19th St., New York 11, N. Y. ADV. PG. 188.
Ⓥ**RAYTHEON MFG. CO.**, Power Tube Div., Waltham 54, Mass. ADV. PG. 257.
Ⓥ**Sherman Industrial Electronics Co.**, 505 Washington Ave., Belleville 9, N. J.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Short Wave Plastic Forming Co., 2921 W. Alameda St., Burbank, Calif.
Ⓥ**Spectrum Mfg. Co.**, 540 N. 63rd St., Philadelphia 31, Pa.
Ⓥ**Standard Telephones & Cables Ltd.**, Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ**Thordarson Electric Mfg. Div., Maguire Industries, Inc.**, 500 W. Huron St., Chicago 10, Ill.
Ⓥ**TITEFLEX, INC.**, 500 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 148.
Weltronic Co., 19500 West 8 Mile Rd., Detroit 19, Mich.
Ⓥ**WESTINGHOUSE ELECTRIC CORP.**, P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Ⓥ**Whiteman, R. A.**, 630 N. Wisner Ave., Park Ridge, Ill.

HEATING, ELECTRONIC—*Dielectric*

Ⓥ**Airtronics Mfg. Co.**, 5145 W. San Fernando Rd., Los Angeles 39, Calif.
Ⓥ**Allis-Chalmers Mfg. Co.**, 935 South 70th St., Milwaukee 1, Wis.
Ⓥ**BARKER & WILLIAMSON**, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ**Ecco High Frequency Corp.**, 7020 Hudson Blvd., North Bergen, N. J.
Ⓥ**Electronic Engineering Corp.**, 624 Ridge Rd., Lyndhurst, N. J.
Ⓥ**GENERAL ELECTRIC CO.**, Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ**Girdler Corp., Thermex Div.**, 224 E. Broadway, Louisville 1, Ky.
Ⓥ**High Frequency Heating Co.**, 143 Glen Park Ave., Gary, Ind.
Ⓥ**Induction Heating Corp.**, 181 Wythe Ave., Brooklyn 11, N. Y.
Ⓥ**Lepel High Frequency Labs., Inc.**, 39 West 60th St., New York 23, N. Y.
Ⓥ**Pan-American Electronics, Inc.**, 5816 S. Santa Fe Ave., Los Angeles 11, Calif.
Ⓥ**RADIO CORP. OF AMERICA**, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
Ⓥ**RADIO RECEPTOR CO.**, 251 W. 19th St., New York 11, N. Y. ADV. PG. 188.
Ⓥ**RAYTHEON MFG. CO.**, Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
Ⓥ**"S" CORRUGATED QUENCHED GAP CO.**, Scientific Electric Div., 107 Monroe St., Garfield, N. J. ADV. PG. 265.
Ⓥ**Sherman Industrial Electronics Co.**, 505 Washington Ave., Belleville 9, N. J.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Short Wave Plastic Forming Co., 2921 W. Alameda St., Burbank, Calif.
Ⓥ**Spectrum Mfg. Co.**, 540 N. 63rd St., Philadelphia 31, Pa.
Ⓥ**Standard Telephones & Cables Ltd.**, Connaught House, Aldwych, London, W. C. 2, England.
Weltronic Co., 19500 West 8 Mile Rd., Detroit 19, Mich.
Ⓥ**WESTINGHOUSE ELECTRIC CORP.**, P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Woodwelding, Inc., 3000 W. Olive Ave., Burbank, Cal.

HEATING, ELECTRONIC—*Induction*

Ⓥ**Ajax Electrothermic Corp.**, Ajax Park, Trenton 5, N. J.
Ⓥ**Allis-Chalmers Mfg. Co.**, 935 South 70th St., Milwaukee 1, Wis.
Ⓥ**BARKER & WILLIAMSON**, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ**Ecco High Frequency Corp.**, 7020 Hudson Blvd., North Bergen, N. J.
Ⓥ**Electronic Engineering Corp.**, 624 Ridge Rd., Lyndhurst, N. J.
Ⓥ**GENERAL ELECTRIC CO.**, Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ**High Frequency Heating Co.**, 143 Glen Park Ave., Gary, Ind.
Ⓥ**Induction Heating Corp.**, 181 Wythe Ave., Brooklyn 11, N. Y.
Ⓥ**Lepel High Frequency Labs., Inc.**, 39 West 60th St., New York 23, N. Y.
Ⓥ**MARION ELECTRICAL INSTRUMENT CO.**, Manchester, N. H. ADV. PG. 130.
Ⓥ**Ohio Crankshaft Co., Tocco Div.**, 3800 Harvard Ave., Cleveland 1, Ohio.
Ⓥ**Progressive Welder Co.**, 3050 E. Outer Drive, Detroit, Mich.
Ⓥ**RADIO CORP. OF AMERICA**, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
Ⓥ**"S" CORRUGATED QUENCHED GAP CO.**, Scientific Electric Div., 107 Monroe St., Garfield, N. J. ADV. PG. 265.

(V) indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

(V)Sherman Industrial Electronics Co., 505 Washington Ave., Belleville 9, N. J.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
(V)Spectrum Mfg. Co., 540 N. 63rd St., Philadelphia 31, Pa.
(V)Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
(V)Thordarson Electric Mfg. Div., Maguire Industries Inc., 500 W. Huron St., Chicago 10, Ill.
Wetronic Co., 19500 West 8 Mile Rd., Detroit 19, Mich.
(V)WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

HEMOGLOBINOMETERS—*Electronic*

(V)Farrand Optical Co., Inc., Bronx Blvd. at 238th St., New York 66, N. Y.
(V)Fisher Scientific Co., 717 Forbes St., Pittsburgh 19, Pa.
(V)Rubicon Co., 4751 Ridge Ave., Philadelphia, Pa.

HOLDERS, CRYSTAL

(V)ALDEN PRODUCTS CO., 117 No. Main St., Brockton 64, Mass. ADV. PG. 235.
(V)AMERICAN LAVA CORP., Chattanooga 5, Tenn. ADV. PG. 27.
(V)Gavin Labs., 1520 Evergreen St., Williamsport, Pa.
Burbank Radio Lab., Wm. W. L., 4814 Idaho St., San Diego, Cal.
(V)CENTRALAB, Div. of Globe Union Inc., 900 E. Keefe Ave., Milwaukee 1, Wis. ADV. PG. 64, 65.
(V)Crystal Research Labs., Inc., 29 Allyn St., Hartford, Conn.
Dalbara Labs., 3066 Santa Monica Blvd., Los Angeles, Cal.
(V)ELECTRICAL INDUSTRIES, INC., 44 Summer Ave., Newark 4, N. J. ADV. PG. 217.
Electronic Mechanics Inc., 76 Clifton Blvd., Clifton, N. J.
(V)Franklin Mfg. Corp., A. W., 43-20 34th St., Long Island City, N. Y.
(V)HERMETIC SEAL PRODUCTS CO., 29-37 So. 4th St., Newark 7, N. J. ADV. PG. 87.
(V)Howard Mfg. Co., 1401 S. Main St., Council Bluffs, Iowa.
(V)INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 240, 247.
(V)KNIGHTS CO., JAMES, 131 S. Wells St., Sandwich, Ill. ADV. PG. 190.
(V)Miller, August F., 9226 Hudson Blvd., North Bergen, N. J.
(V)Nebb Lab., R. E., 1104 Lincoln Place, Brooklyn 13, N. Y.
(V)Polytech Devices, Inc., 11801 E. Grand St., Eliza beth, N. J.
Radio Specialty Mfg. Co., 2021 S. E. Sixth Ave., Portland 14, Oregon.
(V)REEVES HOFFMAN CORP., 321 Cherry St., Carlisle, Pa. ADV. PG. 92.
(V)Scientific Radio Products Co., 738 W. Broadway, Council Bluffs, Iowa.
(V)SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 83, 84.
(V)STUPAKOFF CERAMIC & MFG. CO., Latrobe, Pa. ADV. PG. 141.
(V)Varian Associates, 99 Washington St., San Carlos, Calif.
Westline Electronics Co., 11640 Olympic Blvd., Los Angeles 25, Calif.

HORNS—*Speaker Projector*

(V)Altec Lansing Corp., 161 Avenue of the Americas, New York 13, N. Y.
(V)Atlas Sound Corp., 1443 39th St., Brooklyn 18, N. Y.
(V)Brociner Electronics Lab., 1546 Second Ave., New York 28, N. Y.
(V)Carron Mfg. Co., 415 S. Aberdeen St., Chicago, Ill.
Cattlewood Mfg. Co., 12th & Burnett Sts., Louisville, Ky.
(V)Commercial Radio Sound Corp., 575 Lexington Ave., New York 22, N. Y.
(V)Dick Co., The Seymour, Conn.
(V)ELECTRO-VOICE, INC., Buchanan, Mich. ADV. PG. 207.
King Metal Spinning Co., 174 Centre St., New York 13, N. Y.
(V)Racon Electric Co., 52 E. 19th St., New York 3, N. Y.
(V)UNIVERSITY LOUDSPEAKERS, INC., 80 S. Kensico Ave., White Plains, N. Y. ADV. PG. 231.

HOUSINGS—*Antenna*

(V)Aikin Stamping Co., 1923 Nebraska Ave., Toledo 7, Ohio.
(V)Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.
(V)Donnelly Electric & Mfg. Co., 3050 Washington St., Boston, Mass.
Kennedy & Co., D. S., Cohasset, Mass.
(V)Racon Electric Co., 52 E. 19th St., New York 3, N. Y.
(V)Walter Co., Inc., S., 1400 Atlantic Ave., Brooklyn 16, N. Y.

HOUSINGS—*Automobile Radio*

(V)Aikin Stamping Co., 1923 Nebraska Ave., Toledo 7, Ohio.
(V)Delco Radio Div., General Motors Corp., Kokomo, Ind.
Felsenthal & Sons, Inc., G., 4100 W. Grand Ave., Chicago 51, Ill.
Insulation Mfg. Co., 11 New York Ave., Brooklyn, N. Y.
(V)MULTI METAL WIRE CLOTH CO., INC., 1350 Garrison Ave., New York 59, N. Y. ADV. PG. 66.
(V)Rhine Corp., Tioga & C Sts., Philadelphia 34, Pa.
(V)Walter Co., Inc., S., 1400 Atlantic Ave., Brooklyn 16, N. Y.

HOUSINGS—*Instrument*

(V)Aikin Stamping Co., 1923 Nebraska Ave., Toledo 7, Ohio.
(V)ART-LLOYD METAL PRODUCTS CORP., 2973 Cropsey Ave., Brooklyn 14, N. Y. ADV. PG. 272.
(V)Hevikote Laboratories, P. O. Box 70, Concord, Mass.
(V)Hud Radio Inc., 2118 E. 55th St., Cleveland 3, Ohio.
(V)Icor Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
(V)Donnelly Electric & Mfg. Co., 3050 Washington St., Boston, Mass.
(V)FALSTROM CO., 44 Fastrom Court, Passaic, N. J. ADV. PG. 162.
Felsenthal & Sons, Inc., G., 4100 W. Grand Ave., Chicago 51, Ill.
(V)GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Insulation Mfg. Co., 11 New York Ave., Brooklyn, N. Y.
(V)KARP METAL PRODUCTS CO., INC., 215 63rd St., Brooklyn 20, N. Y. ADV. PG. 53.
(V)Minute Man Products, Inc., 309 E. 22nd St., New York 10, N. Y.
(V)MULTI METAL WIRE CLOTH CO., INC., 1350 Garrison Ave., New York 59, N. Y. ADV. PG. 66.
(V)PAR-METAL PRODUCTS CORP., 32-62 49th St., Long Island City 3, N. Y. ADV. PG. 242.
(V)Plastimold Corp., Attleboro, Mass.
R-V Mfg. Corp., Jericho Turnpike, Mineola, N. Y.
(V)RICHARDSON CO., THE, 2767 Lase St., Melrose Park, Ill. ADV. PG. 144.
(V)Walter Co., Inc., S., 1400 Atlantic Ave., Brooklyn 16, N. Y.
(V)Waterbury Companies, Inc., Waterbury 90, Conn.

HOUSINGS—*Public Address System*

Altec Lansing Corp., 161 Avenue of the Americas, New York 13, N. Y.
American Communications Corp., 306 Broadway, New York 7, N. Y.
(V)Atlas Sound Corp., 1443 39th St., Brooklyn 18, N. Y.
Cattlewood Mfg. Co., 12th & Burnett Sts., Louisville, Ky.
(V)Cetalie Corp. of America, 1 Park Ave., New York 16, N. Y.
(V)Commercial Radio Sound Corp., 575 Lexington Ave., New York 22, N. Y.
(V)Donnelly Electric & Mfg. Co., 3050 Washington St., Boston, Mass.
(V)KARP METAL PRODUCTS CO., INC., 215 63rd St., Brooklyn 20, N. Y. ADV. PG. 53.
King Metal Spinning Co., 174 Centre St., New York 13, N. Y.
(V)Magna Electronics Co., 3707-11 W. Jefferson, Los Angeles 16, Calif.
(V)Minute Man Products, Inc., 309 E. 22nd St., New York 10, N. Y.
(V)MULTI METAL WIRE CLOTH CO., INC., 1350 Garrison Ave., New York 59, N. Y. ADV. PG. 66.
(V)PAR-METAL PRODUCTS CORP., 32-62 49th St., Long Island City 3, N. Y. ADV. PG. 242.
(V)Racon Electric Co., 52 E. 19th St., New York 3, N. Y.
(V)RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 13 to 25. Inside Back and Back Covers.
Stephens Mfg. Corp., 8538 Warner Drive, Culver City, Calif.
(V)Vibrasic Corporation, 425 Bush St., San Francisco 8, Calif.
(V)Walter Co., Inc., S., 1400 Atlantic Ave., Brooklyn 16, N. Y.

HOUSINGS—*Speaker*

(V)Aikin Stamping Co., 1923 Nebraska Ave., Toledo 7, Ohio.
(V)Altec Lansing Corp., 161 Avenue of the Americas, New York 13, N. Y.
American Communications Corp., 306 Broadway, New York 7, N. Y.
(V)ART-LLOYD METAL PRODS. CORP., 2973 Cropsey Ave., Brooklyn 14, N. Y. ADV. PG. 272.
(V)Atlas Sound Corp., 1443 39th St., Brooklyn 18, N. Y.
(V)Brociner Electronics Lab., 1546 Second Ave., New York 28, N. Y.
(V)Hud Radio Inc., 2118 E. 55th St., Cleveland 3, Ohio.
Cattlewood Mfg. Co., 12th & Burnett Sts., Louisville, Ky.
(V)Commercial Radio Sound Corp., 575 Lexington Ave., New York 22, N. Y.
(V)Donnelly Electric & Mfg. Co., 3050 Washington St., Boston, Mass.
(V)ELECTRO-VOICE, INC., Buchanan, Mich. ADV. PG. 207.
(V)Electronic Workshop, Inc., 351 Bleecker St., New York 14, N. Y.
(V)GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
Hartley Co., Ltd., H. A., 152 Hammersmith Rd., London W. 6, England.
(V)Howley Products Co., St. Charles, Ill.
(V)JENSEN MFG. CO., 4601 S. Laramie Ave., Chicago 38, Ill. ADV. PG. 91.
(V)KARP METAL PRODUCTS CO., INC., 215 63rd St., Brooklyn 20, N. Y. ADV. PG. 53.
King Metal Spinning Co., 174 Centre St., New York 13, N. Y.
(V)Magna Electronics Co., 3707-11 W. Jefferson, Los Angeles 16, Calif.
(V)MULTI METAL WIRE CLOTH CO., INC., 1350 Garrison Ave., New York 59, N. Y. ADV. PG. 66.
(V)Muraska Mfg. Co., Wm. J., Chelsea, Mass.
(V)PAR-METAL PRODUCTS CORP., 32-62 49th St., Long Island City 3, N. Y. ADV. PG. 242.
R-V Mfg. Corp., Jericho Turnpike, Mineola, N. Y.
(V)Racon Electric Co., 52 E. 19th St., New York 3, N. Y.
(V)RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 13 to 25. Inside Back and Back Covers.
Stephens Mfg. Corp., 8538 Warner Drive, Culver City, Calif.
(V)Vibrasic Corporation, 425 Bush St., San Francisco 8, Calif.
(V)Walter Co., Inc., S., 1400 Atlantic Ave., Brooklyn 16, N. Y.

IGNITION SYSTEMS—*Electronic*

(V)GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
(V)Hallett Mfg. Co., 1601 Florence Ave., Inglewood, Calif.

IGNITRON

See Tubes

IMPREGNATING COMPOUNDS

See Insulating Compounds

IMPREGNATING MACHINES

See Machines

IMPREGNATING WAX

See Wax, Impregnating

INDICATORS—*Antenna Position*

(V)Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.
Electro-Mechanical Instrument Co., 812 Chestnut St., Perkasie, Pa.
(V)GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y.
(V)Johnson Co., E. F., Waseca, Minn.
(V)Kurman Mfg. Co., 9205 Detroit Ave., Cleveland 2, Ohio.

INDICATORS, ARC BACK

(V)Walsirt Co., 5808 Marilyn Ave., Culver City, Cal.*

INDICATORS—*Automatic Mixture Control*

(V)Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.
(V)Minneapolis-Honeywell Regulator Co., 2753 Fourth Avenue, S., Minneapolis, Minn.

INDICATORS—*Capacitor Leakage*

(V)ELECTRONIC INSTRUMENT CO., INC., 276 Newport St., Brooklyn 12, N. Y. ADV. PG. 274.
(V)Industrial Instruments Inc., 17 Pollack Ave., Jersey City 5, N. J.
McMurdo Silver Co., Inc., 1240 Main St., Hartford 3, Conn.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

INDICATORS—*Density*

See Indicators, Specific Gravity

INDICATORS—*Detonation Indicators & Meters*

Ⓥ Control Engineering Corp., 863 Washington St., Canton, Mass.
Ⓥ Electro Products Labs., Inc., 549 W. Randolph St., Chicago 6, Ill.
Phillips Petroleum Co., Special Products Div., Bartlesville, Okla.
Ⓥ Photocon Research Products, 1062 N. Allen Ave., Pasadena 7, Calif.
Ⓥ SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 89, 86.

INDICATORS—*Dew Point*

American Instrument Co., 8030 Georgia Ave., Silver Spring, Md.
Ⓥ Fielden Electronics Inc., 1171 New York Ave., Huntington Station, N. Y.
Ⓥ Foxboro Co., The, Foxboro, Mass.
Ⓥ Illinois Testing Labs., Inc., 420 N. LaSalle St., Chicago 10, Ill.
Ⓥ Minneapolis-Honeywell Regulator Co., 2753 Fourth Avenue, S., Minneapolis, Minn.
Ⓥ Welch Scientific Co., W. M., 1515 Sedgwick St., Chicago 10, Ill.

INDICATORS—*Dielectric Constant*

Ⓥ H. M. R. Electronics, Inc., Grove St., New Canaan, Conn.
Ⓥ Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ Thompson & Associates, John E., 7210 S. Yates Ave., Chicago 49, Ill.

INDICATORS—*Film Thickness*

American Instrument Co., 8030 Georgia Ave., Silver Spring, Md.
Ⓥ Fielden Electronics Inc., 1171 New York Ave., Huntington Station, N. Y.
Ⓥ Pratt & Whitney Div., Niles-Bement-Pond Co., West Hartford 1, Conn.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ Standard Electronics Research Corp., 2 East End Ave., New York 21, N. Y.
Ⓥ Tracerlab, Inc., 130 High St., Boston 10, Mass.

INDICATORS—*Fluid Conductivity*

Ⓥ Bailey Meter Co., 1044 Ivanhoe Rd., Cleveland 10, Ohio
Ⓥ Foxboro Co., The, Foxboro, Mass.
Ⓥ Industrial Instruments Inc., 17 Pollack Ave., Jersey City 5, N. J.
Ⓥ Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
Lumenite Electric Co., 407 S. Dearborn St., Chicago, Ill.
Ⓥ Marconi Instruments, Ltd., 23 Beaver St., New York 4, N. Y.
Ⓥ Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Roberts Aves., Philadelphia 44, Pa.
Ⓥ Photoswitch, Inc., 77 Broadway, Cambridge 42, Mass.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ Thompson & Associates, John E., 7210 S. Yates Ave., Chicago 49, Ill.

INDICATORS—*Fluid Flow*

Ⓥ Air Associates, Inc., Teterboro, N. J.
Ⓥ Autocall Co., The, Shelby, Ohio
Ⓥ Bailey Meter Co., 1044 Ivanhoe Road, Cleveland 10, Ohio
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ ECLIPSE-PIONEER DIV., Bendix Aviation Corp., Teterboro, N. J. ADV. PG. 176.
Ⓥ Fischer & Porter Co., Hatboro, Pa.
Ⓥ Foxboro Co., The, Foxboro, Mass.
Harshaw Scientific Div. of The Harshaw Chemical Co., 1945 E. 97th St., Cleveland 6, Ohio
Ⓥ Illinois Testing Labs., Inc., 420 N. LaSalle St., Chicago 10, Ill.
Ⓥ Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
Ⓥ Leupold & Stevens Instruments, Inc., 4445 N. E. Glisan St., Portland 13, Ore.
Lumenite Electric Co., 407 S. Dearborn St., Chicago, Ill.
Ⓥ Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Roberts Aves., Philadelphia 44, Pa.
Ⓥ U. S. Gauge Div., American Machine & Metals, Inc., Sellersville, Pa.

INDICATORS—*Frequency*

Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ Berkeley Scientific Co., Richmond, Calif.
Ⓥ Biddle Co., James G., 1316 Arch St., Philadelphia 7, Pa.
Erco Radio Labs., Inc., East Stewart Ave., Garden City, N. Y.
Ⓥ Daven Co., 191 Central Ave., Newark 4, N. J.
Ⓥ Furst Electronics, 10A S. Jefferson St., Chicago 6, Ill.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ GENERAL RADIO CO., 27 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Ⓥ Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
Ⓥ Marconi Instruments, Ltd., 23 Beaver St., New York 4, N. Y.
Ⓥ MEASUREMENTS CORP., Boonton, N. J. ADV. PG. 145.
Ⓥ POTTER INSTRUMENT CO., 115 Cutter Mill Rd., Great Neck, N. Y. ADV. PG. 204.
Ⓥ Sheffield Instrument Corp., 2021 N. Lincoln St., Burbank, Calif.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 89, 86.
Ⓥ Varo Mfg. Co., Inc., Box 638, Garland, Texas.
Ⓥ Westberg Mfg. Co., 612 N. Michigan Ave., Chicago 11, Ill.
Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.
Woodwelding, Inc., 3000 W. Olive Ave., Burbank, Calif.

INDICATORS—*Geiger Counter*

Alpha Laboratories, Box 184, Belmar, N. J.
Ⓥ Anton Electronic Laboratories, Inc., 1226-1238 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ Berkeley Scientific Co., Richmond, Calif.
Electronic Products Co., 111 E. 3rd St., Mt. Vernon, N. Y.
Ⓥ ELTRONICS, INC., 2649 No. Howard St., Philadelphia 33, Pa. ADV. PG. 238.
Ⓥ Fischer Research Lab., 1961 University Ave., Palo Alto, Calif.
Ⓥ FLADER INC., Frederic, North Tonawanda, N. Y. ADV. PG. 240.
Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Ⓥ Geophysical Instrument Co., 1820 N. Nash St., Arlington, Va.
Harshaw Scientific Div. of The Harshaw Chemical Co., 1945 E. 97th St., Cleveland 6, Ohio.
Ⓥ Kelley-Koett Mfg. Co., Instrument Div., 12 E. 6th St., Covington, Ky.
Ⓥ Manufacturers Eng. & Equip. Corp., Willow Grove, Pa.
Ⓥ National Technical Laboratories, 820 Mission St., South Pasadena, Calif.
Ⓥ Nuclear Development Lab., P. O. Box 7034, Kansas City, Mo.
Ⓥ Nuclear Instrument & Chemical Corp., 223 W. Erie St., Chicago 10, Ill.
Ⓥ Nucleonic Corp. of America, The, 497 Union St., Brooklyn 31, N. Y.
Ⓥ POTTER INSTRUMENT CO., INC., 115 Cutter Mill Rd., Great Neck, N. Y. ADV. PG. 204.
Ⓥ Radiation Counter Laboratories, Inc., 1844 W. 21 St., Chicago 8, Ill.
Ⓥ Radioactive Products, Inc., 3201 E. Woodbridge St., Detroit 7, Mich.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ Special Instruments Laboratory, Inc., 1803 Highland Ave., Knoxville, Tenn.
Ⓥ Tracerlab, Inc., 130 High St., Boston 10, Mass.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

INDICATORS—*Hardness*

Ⓥ Barber-Colman Co., Rockford, Ill.
Ⓥ Rubicon Co., 3751 Ridge Ave., Philadelphia, Pa.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.

INDICATORS—*Humidity*

American Instrument Co., 8030 Georgia Ave., Silver Spring, Md.
Ⓥ ECLIPSE-PIONEER DIV., BENDIX AVIATION CORP., Teterboro, N. J. ADV. PG. 176.
Ⓥ Fielden Electronics Inc., 1171 New York Ave., Huntington Station, N. Y.
Ⓥ Foxboro Co., The, Foxboro, Mass.
Ⓥ Friez Instrument Div., Bendix Aviation Corp., Baltimore 4, Md.
Ⓥ Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
Ⓥ Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Roberts Aves., Philadelphia 44, Pa.
Serdex, Inc., 91 Cambridge St., Boston, Mass.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

INDICATORS—*Illumination*

Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Kirkland Co., H. R., The, 8 King St., Morristown, N. J.
Lumenite Electric Co., 407 S. Dearborn St., Chicago, Ill.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

INDICATORS—*Liquid Level*

Ⓥ Air Associates, Inc., Teterboro, N. J.
Ⓥ Airlectron Inc., P. O. Box 151, Caldwell, N. J.
Ⓥ Allis-Chalmers Mfg. Co., 935 South 70th St., Milwaukee 1, Wis.
Autocall Co., The, Shelby, Ohio
Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.
Ⓥ Bailey Meter Co., 1044 Ivanhoe Rd., Cleveland 10, Ohio
Ⓥ Baldwin Locomotive Works, Philadelphia 42, Pa.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ ECLIPSE-PIONEER DIV., Bendix Aviation Corp., Teterboro, N. J. ADV. PG. 176.
Ⓥ Ess Instrument Co., 90 S. Washington Ave., Bergenfield, N. J.
Ⓥ Fischer & Porter Co., Hatboro, Pa.
Fisher Research Lab., 1961 University Ave., Palo Alto, Calif.
Ⓥ Foxboro Co., The, Foxboro, Mass.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Industrial Electronics Co., Inc., Hanover, Mass.
Ⓥ Leupold & Stevens Instruments, Inc., 4445 N. E. Glisan St., Portland 13, Ore.
Lumenite Electric Co., 407 S. Dearborn St., Chicago, Ill.
Ⓥ Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Roberts Aves., Philadelphia 44, Pa.
Ⓥ Mosher Electronic Controls, 130 W. 42nd St., New York, N. Y.
Ⓥ Photoswitch, Inc., 77 Broadway, Cambridge 42, Mass.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ Trico Fuse Mfg. Co., 2948 North Fifth, Milwaukee 12, Wis.
Ⓥ Vapor Recovery Systems Co., 2820 N. Alameda, Compton, Calif.
Ⓥ Warrick Co., Charles F., 16251 Hamilton Ave., Detroit 3, Mich.
Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

INDICATORS—*Materials Thickness*

Ⓥ Electric Eye Equipment Co., 16 W. Fairchild St., Danville, Ill.
Ⓥ Fielden Electronics, Inc., 1171 New York Ave., Huntington Station, N. Y.
Ⓥ Foxboro Co., The, Foxboro, Mass.
Ⓥ INDUSTRIAL ELECTRONICS, INC., 2457 Woodward Ave., Detroit 1, Mich. ADV. PG. 255.
Ⓥ Photocon Research Products, 1062 N. Allen Ave., Pasadena 7, Calif.
Ⓥ Pratt-Whitney Div., Niles-Bement-Pond Co., West Hartford 1, Conn.
Ⓥ Schaevitz Engineering, Crescent Blvd. at Drexel Ave., Pennsauken Township, Camden 11, N. J.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ Standard Electronics Research Corp., 2 East End Ave., New York 21, N. Y.
Ⓥ Stevens-Arnold, Inc., 22 Elkins St., South Boston 27, Mass.
Ⓥ Tracerlab, Inc., 130 High St., Boston 10, Mass.

INDICATORS—*Moisture*

Ⓥ Fielden Electronics, Inc., 1171 New York Ave., Huntington Station, N. Y.
Ⓥ Foxboro Co., The, Foxboro, Mass.
Harshaw Scientific Div. of The Harshaw Chemical Co., 1945 E. 97th St., Cleveland 6, Ohio.
Ⓥ Marconi Instruments, Ltd., 23 Beaver St., New York 4, N. Y.
Ⓥ MEASUREMENTS CORP., Boonton, N. J. ADV. PG. 145.
Ⓥ Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Roberts Aves., Philadelphia 44, Pa.
Ⓥ North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

INDICATORS—*Nuclear Radiation*

Ⓥ Anton Electronic Laboratories, Inc., 1226-1238 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ Applied Physics Corp., 30 W. Green St., Pasadena 1, Calif.
Ⓥ ATOMIC INSTRUMENT CO., 160 Charles St., Boston, Mass. ADV. PG. 218.
Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ Berkeley Scientific Co., Richmond, Calif.
Ⓥ CHATHAM ELECTRONICS CORP., 475 Washington St., Newark 2, N. J. ADV. PG. 126.
Ⓥ Clarkston Corp., 11927 S.W. Pico Blvd., Los Angeles 64, Calif.
Ⓥ Cossor (Canada) Ltd., 301-303 Windsor St., Halifax, N. S., Canada.
Electronic Products Co., 111 E. 3rd St., Mt. Vernon, N. Y.
Ⓥ EL-TRONICS, INC., 2649 N. Howard St., Philadelphia 33, Pa. ADV. PG. 236.
Ⓥ FLADER, INC., FREDERIC, North Tonawanda, N. Y. ADV. PG. 240.
Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Syracuse, N. Y. ADV. PG. 5 to 18.
Ⓥ Geophysical Instrument Co., 1820 N. Nash St., Arlington, Va.
Harshaw Scientific Div. of The Harshaw Chemical Co., 1945 E. 97th St., Cleveland 6, Ohio.
Ⓥ Kelley-Koett Mfg. Co., Instrument Div., 12 E. 6th St., Covington, Ky.
Ⓥ Manufacturers Engr. & Equip. Corp., Willow Grove, Pa.
Ⓥ National Technical Laboratories, 820 Mission St., South Pasadena, Calif.
Ⓥ North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
Ⓥ Nuclear Development Lab., P. O. Box 7034, Kansas City, Mo.
Ⓥ Nuclear Instrument & Chemical Corp., 223 W. Erie St., Chicago 10, Ill.
Ⓥ Nucleonic Corp. of America, The, 497 Union St., Brooklyn 31, N. Y.
Ⓥ POTTER INSTRUMENT CO., INC., 115 Cutter Mill Rd., Great Neck, N. Y. ADV. PG. 204.
Ⓥ Radiation Counter Laboratories, Inc., 1844 W. 71st St., Chicago 8, Ill.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 75. Inside Back and Back Cover.
Ⓥ Radiation Products, Inc., 4201 E. Windsor Ave., Detroit 7, Mich.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ Special Instruments Laboratory, Inc., 1564 Highland Ave., Knoxville, Tenn.
Ⓥ Tracerlab, Inc., 130 High St., Boston 10, Mass.

INDICATORS—*Ocean Depth*

Ⓥ Edo Corp., College Point, Long Island, N. Y.
Ⓥ Impanex Corp., 2701 California Ave., Seattle 6, Wash.
Ⓥ Kaar Engineering Co., 2995 Middlefield Rd., Palo Alto, Calif.
Ⓥ Submarine Signal Div., Raytheon Mfg. Co., Waltham, Mass.

INDICATORS—*Oxygen*

Ⓥ Bailey Meter Co., 1044 Ivanhoe Rd., Cleveland 10, Ohio.
Ⓥ Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
Ⓥ Minneapolis-Honeywell Regulator Co., 2753 Fourth Avenue S., Minneapolis, Minn.

INDICATORS—*pH*

Ⓥ Bailey Meter Co., 1044 Ivanhoe Rd., Cleveland 10, Ohio.
Ⓥ Central Scientific Co., 1700 Irving Park Rd., Chicago 13, Ill.
Fisher Research Lab., 1961 University Ave., Palo Alto, Calif.
Ⓥ Foxboro Co., The, Foxboro, Mass.
Harshaw Scientific Div. of The Harshaw Chemical Co., 1945 E. 97th St., Cleveland 6, Ohio.
Ⓥ Ira Mathe Chemical Products Co., Towson 4, Baltimore, Md.
Ⓥ Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
Ⓥ Mallinckrodt Chemical Works, Second & Mallinckrodt Sts., St. Louis 7, Mo.
Ⓥ Manostat Corp., 10 E. 39th St., New York 16, N. Y.
Ⓥ Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Roberts Ave., Philadelphia 44, Pa.
Ⓥ National Technical Laboratories, 820 Mission St., South Pasadena, Calif.
Ⓥ North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
Photovolt Corp., 95 Madison Ave., New York 16, N. Y.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ Thwing-Albert Instrument Co., 4351 Pulaski Ave., Philadelphia 44, Pa.
Ⓥ Wallace & Tiernan Products, Inc., Belleville 9, N. J.

INDICATORS—*Photographic Exposure*

Ⓥ American Scientific Co., P. O. Box 1, Highbridge Station, New York 52, N. Y.
Davies Laboratories, Inc., 4705 Queensbury Rd., Riverdale, Md.
Ⓥ DEJUR-AMSCO CORP., Northern Blvd., at 45th St., Long Island City 1, N. Y. ADV. PG. 267.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ HICKOK ELECTRICAL INSTRUMENTS CO., 10514 Dupont Ave., Cleveland, Ohio. ADV. PG. 215.
Ⓥ MARION ELECTRICAL INSTRUMENT CO., Manchester, N. H. ADV. PG. 130.
Photovolt Corp., 95 Madison Ave., New York 16, N. Y.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

INDICATORS—*Positioning*

Ⓥ Air Associates, Inc., Teterboro, N. J.
Ⓥ Allis-Chalmers Mfg. Co., 935 South 70th St., Milwaukee 1, Wis.
Ⓥ Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ ECLIPSE-PIONEER DIV., Bendix Aviation Corp., Teterboro, N. J. ADV. PG. 176.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Hastings Instrument Co., Box 1275, Hampton, Va.
Ⓥ INDUSTRIAL ELECTRONICS, INC., 2457 Woodward Ave., Detroit 1, Mich. ADV. PG. 245.
Ⓥ Leer, Inc., 110 Iona Ave., N. W., Grand Rapids 2, Mich.
Ⓥ O'Connor & Co., John T., West Orange, N. J.
Ⓥ Robinette Co., W. C., 802 Fair Oaks Ave., South Pasadena, Calif.
Ⓥ Schaevitz Engineering, Crescent Blvd., at Drexel Ave., Pennsauken Township, Camden 11, N. J.
Ⓥ SERVO-TEK PRODUCTS CO., 4 Godwin Ave., Paterson 1, N. J. ADV. PG. 187.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ Stevens-Arnold Inc., 22 Elkins St., South Boston 27, Mass.
Ⓥ Vans Mfg. Co., Inc., Box 638, Garland, Texas.

INDICATORS—*Power Level*

Ⓥ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ Daven Co., 191 Central Ave., Newark 4, N. J.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Marconi Instruments, Ltd., 23 Beaver St., New York 4, N. Y.
Ⓥ Meters, Inc., 915 Westfield Blvd., Indianapolis 20, Ind.
Ⓥ POLYTECHNIC RESEARCH & DEVELOPMENT CO., INC., 202 Tillary St., Brooklyn 1, N. Y. ADV. PG. 49.
Ⓥ SHALLCROSS MFG. CO., 10 Jackson Ave., Collingdale, Pa. ADV. PG. 221.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.
Ⓥ Tech Laboratories, Inc., Bergen & Edsall Blvds., Palisades Park, N. J.
Ⓥ Triplett Electrical Instrument Co., 286 Harmon Rd., Bluffton, Ohio.
Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

INDICATORS—*Pressure*

Ⓥ Autocall Co., The, Shelby, Ohio.
Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.
Ⓥ Bailey Meter Co., 1044 Ivanhoe Rd., Cleveland 10, Ohio.
Ⓥ Baldwin Locomotive Works, Philadelphia 42, Pa.
Ⓥ Control Engineering Corp., 863 Washington St., Canton, Mass.
Ⓥ Dillon & Co., Inc., W. C., 5410 W. Harrison St., Chicago 44, Ill.
Ⓥ ECLIPSE-PIONEER DIV., BENDIX AVIATION CORP., Teterboro, N. J. ADV. PG. 176.
Ⓥ Electro Products Labs., 549 W. Randolph St., Chicago 6, Ill.
Ⓥ FLADER, INC., Frederic, North Tonawanda, N. Y. ADV. PG. 240.
Foxboro Co., The, Foxboro, Mass.
Ⓥ INDUSTRIAL ELECTRONICS, INC., 2457 Woodward Ave., Detroit 1, Mich. ADV. PG. 245.
Ⓥ Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
Ⓥ Manning, Maxwell & Moore, Inc., Stratford, Conn.
Ⓥ Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Roberts Aves., Philadelphia 44, Pa.
Nurnberg Thermometer Co., Inc., 4 Corey St., Boston 32, Mass.
Ⓥ Photocon Research Products, 1062 N. Allen Ave., Pasadena 7, Calif.
Ⓥ Schaevitz Engineering, Crescent Blvd. at Drexel Ave., Pennsauken Township, Camden 11, N. J.
Serdex, Inc., 91 Cambridge St., Boston, Mass.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Sierra Electronic Corp., San Carlos, Calif.
Ⓥ U. S. Gauge Div., American Machine & Metals, Inc., Sellersville, Pa.
Ⓥ Wallace & Tiernan Products, Inc., Belleville 9, N. J.

INDICATORS—*Recording Engine*

Ⓥ Commercial Research Labs., Inc., 20 Bartlett Ave., Detroit 3, Mich.
Ⓥ Cossor (Canada) Ltd., 301-303 Windsor St., Halifax, N. S., Canada.
Ⓥ HAYDON CO., A. W., THE, 232 N. Elm St., Waterbury, Conn. ADV. PG. 236.
Ⓥ Photocon Research Products, 1062 N. Allen Ave., Pasadena 7, Calif.

INDICATORS—*Shorted Turn*

Ⓥ Kahron Inc., Box 472, Huntington Beach, Calif.
Ⓥ Rubicon Co., 8751 Ridge Ave., Philadelphia, Pa.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.

INDICATORS—*Smoke & Combustion*

Ⓥ Bailey Meter Co., 1044 Ivanhoe Road, Cleveland 10, Ohio.
Ⓥ Electronic Control Corp., 1573 E. Forest St., Detroit, Mich.
Ⓥ Ess Instrument Co., 96 So. Washington Ave., Bergenfield, N. J.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Industrial Electronics Co., Inc., Hanover, Mass.
Ⓥ Electro-Max Inc., 15 S. First St., Geneva, Ill.
Ⓥ Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
Lumenite Electric Co., 407 S. Dearborn St., Chicago, Ill.
Ⓥ Minneapolis-Honeywell Regulator Co., 2753 Fourth Avenue S., Minneapolis, Minn.
Ⓥ Photobell Company, 116 Nassau St., New York 7, N. Y.
Ⓥ Photoswitch, Inc., 77 Broadway, Cambridge 42, Mass.
Photovolt Corp., 95 Madison Ave., New York 16, N. Y.

INDICATORS—*Sound Level*

Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ Daven Co., 191 Central Ave., Newark 4, N. J.
Ⓥ Fairchild Recording Equipment Corp., 154 St., & 7th Ave., Whitestone, N. Y.
Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Hart & Co., Inc., Frederick, 849 Main Ave., Poughkeepsie, N. Y.
Ⓥ International Instruments, Inc., 341 East St., New Haven 11, Conn.
Ⓥ Massa Laboratories, 3868 Carnegie St., Cleveland, Ohio.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ Simpson Electric Co., Div. of American Gage & Machine Co., 4200 W. Kinzie St., New Haven 11, Conn.
Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.
Triplett Electrical Instrument Co., 286 Harmon Rd., Bluffton, Ohio.

INDICATORS—*Specific Gravity*

Engineering Lab., Inc., 602 E. 4th St., Tulsa 3, Okla.
Ⓥ Ess Instrument Co., 96 So. Washington Ave., Bergenfield, N. J.
Ⓥ Fischer & Porter Co., Hatboro, Pa.
Ⓥ Foxboro Co., The, Foxboro, Mass.
Harshaw Scientific Div. of The Harshaw Chemical Co., 1945 E. 97th St., Cleveland 6, Ohio.
Ⓥ Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
Ⓥ Magnetic Instrument Co., 82 W. Main St., West Orange, N. J.
Ⓥ Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Roberts Aves., Philadelphia 44, Pa.

INDICATORS—*Strain*

Ⓥ Anderson, Arthur R., 110 Woodbury Ave., Springdale, Conn.
Ⓥ Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.
Ⓥ Baldwin Locomotive Works, Philadelphia 42, Pa.
Ⓥ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ Dillon & Co., Inc., W. C., 5410 W. Harrison St., Chicago 44, Ill.

Ⓥ**ELECTRONIC TUBE CORP.**, 1200 E. Mermaid Lane, Philadelphia 18, Pa. ADV. PG. 156.
Ⓥ**Ellis Associates**, Box 77, Pelham 65, N. Y.
Ⓥ**Foxboro Co., The**, Foxboro, Mass.
Ⓥ**Hathaway Instrument Co.**, 1315 S. Clarkson St., Denver 10, Colo.
Ⓥ**INDUSTRIAL ELECTRONICS, INC.**, 2457 Woodward Ave., Detroit, Mich. ADV. PG. 255.
Ⓥ**Minneapolis-Honeywell Regulator Co.**, 2753 Fourth Avenue S., Minneapolis, Minn.
Ⓥ**North American Philips Co., Inc.**, 100 E. 42nd St., New York 17, N. Y.
Ⓥ**Schaevitz Engineering**, Crescent Blvd. at Drexel Ave., Pennsauken Township, Camden 11, N. J.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Sierra Electronic Corp., San Carlos, Calif.

INDICATORS—*Telemetering*

Ⓥ**Air Associates, Inc.**, Teterboro, N. J.
Ⓥ**Applied Science Corp. of Princeton, The**, P. O. Box 44, Princeton, N. J.
Ⓥ**Automatic Temperature Control Co., Inc.**, 5212 Pulaski Ave., Philadelphia 44, Pa.
Ⓥ**Bailey Meter Co.**, 1044 Ivanhoe Rd., Cleveland 10, Ohio.
Ⓥ**Bendix Aviation Corp., Pacific Division**, 11600 Sherman Way, N. Hollywood, Calif.
Ⓥ**Bristol Co., The**, Waterbury 20, Conn.
Ⓥ**FLADER, INC., FREDERIC**, North Tonawanda, N. Y. ADV. PG. 240.
Ⓥ**GENERAL ELECTRIC CO.**, Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ**Illinois Testing Labs., Inc.**, 420 N. LaSalle St., Chicago 10, Ill.
Ⓥ**Lear, Inc.**, 110 Ionia Ave., NW., Grand Rapids 2, Mich.
Ⓥ**Leeds & Northrup Co.**, 4970 Stenton Ave., Philadelphia 44, Pa.
Ⓥ**Leopold & Stevens Instruments, Inc.**, 4445 N. E. Glisan St., Portland 13, Ore.
Ⓥ**PANORAMIC RADIO PRODUCTS, INC.**, 10 South Second Ave., Mt. Vernon, N. Y. ADV. PG. 270.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Smuckler & Co., Inc., A. F., 202 Tillary St., Brooklyn 1, N. Y.
Ⓥ**Thompson & Associates, John E.**, 7210 S. Yates Ave., Chicago 49, Ill.

INDICATORS—*Temperature*

Ⓐ**Assembly Products, Inc.**, Chagrin Falls 6, Ohio.
Ⓥ**Autocall Co., The**, Shelby, Ohio.
Ⓥ**Automatic Temperature Control Co., Inc.**, 5212 Pulaski Ave., Philadelphia 44, Pa.
Ⓥ**Bailey Meter Co.**, 1044 Ivanhoe Rd., Cleveland 10, Ohio.
Ⓥ**Cole Instrument Co.**, 1320 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ**Dillon & Co., W. C.**, 5410 W. Harrison St., Chicago 44, Ill.
Ⓥ**EDISON INC., THOMAS A.**, Instrument Div., West Orange, N. J. ADV. PG. 129.
Ⓥ**Fischer & Porter Co.**, Hatboro, Pa.
Fisher Research Lab., 1961 University Ave., Palo Alto, Calif.
Ⓥ**Foxboro Co., The**, Foxboro, Mass.
Ⓥ**Friez Instrument Div., Bendix Aviation Corp.**, Baltimore 4, Md.
Ⓥ**GENERAL ELECTRIC CO.**, Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ**Gordon Co., Claud S.**, 3000 S. Wallace St., Chicago 16, Ill.
General Controls Co., Glendale 1, Calif.
Ⓥ**Illinois Testing Labs., Inc.**, 420 N. LaSalle St., Chicago 10, Ill.
J B T INSTRUMENTS, INC., 441 Chapel St., New Haven 8, Conn. ADV. PG. 261.
Ⓥ**Leeds & Northrup Co.**, 4970 Stenton Ave., Philadelphia 44, Pa.
Ⓥ**Lewis Engineering Co.**, 52 Rubber Ave., Naugatuck, Conn.
Ⓥ**Manning, Maxwell & Moore, Inc.**, Stratford, Conn.
Ⓥ**MARION ELECTRICAL INSTRUMENT CO.**, Manchester, N. H. ADV. PG. 130.
Ⓥ**Meters, Inc.**, 915 Westfield Blvd., Indianapolis 20, Ind.
Ⓥ**Minneapolis-Honeywell Regulator Co.**, Industrial Div., Wayne & Roberts Aves., Philadelphia 44, Pa.
Nuremberg Thermometer Co., Inc., 4 Corey St., Boston 32, Mass.
Philadelphia Thermometer Co., 4401 N. Sixth St., Philadelphia, Pa.
Ⓥ**Rubicon Co.**, 3751 Ridge Ave., Philadelphia, Pa.
Ⓥ**Sensitive Research Instrument Corp.**, 9 Elm Ave., Mt. Vernon, N. Y.
Serdex, Inc., 91 Cambridge St., Boston, Mass.
Ⓥ**Simpson Electric Co., Div. of American Gage & Machine Co.**, 5208 W. Kinzie St., Chicago 44, Ill.
Ⓥ**Thwing-Albert Instrument Co.**, 5351 Pulaski Ave., Philadelphia 44, Pa.
Ⓥ**U. S. Gauge Div., American Machine & Metals, Inc.**, Sellersville, Pa.
Ⓥ**WESTINGHOUSE ELECTRIC CORP.**, P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Ⓥ**Wheelco Instruments Co.**, 847 W. Harrison St., Chicago 7, Ill.

INDICATORS—*Timing*

Ⓥ**Airlectron, Inc.**, P. O. Box 151, Caldwell, N. J.
Ⓥ**AMERICAN CHRONOSCOPE CORP.**, 316 W. First St., Mt. Vernon, N. Y. ADV. PG. 84.
Ⓥ**Automatic Temperature Control Co., Inc.**, 5212 Pulaski Ave., Philadelphia 44, Pa.
Ⓥ**Berkeley Scientific Co.**, Richmond, Calif.
Ⓥ**CRAMER CO., INC., R. W.**, Box 13, Centerbrook, Conn. ADV. PG. 208.
Electric Tachometer Corp., 2218 Vine St., Philadelphia 3, Pa.
Ⓥ**Gale Dorothea Mechanisms**, 37-61 85th St., Jackson Heights, L. I., N. Y.
Ⓥ**GENERAL ELECTRIC CO.**, Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Harshaw Scientific Div. of The Harshaw Chemical Co., 1945 E. 97th St., Cleveland 6, Ohio.
Ⓥ**HAYDON CO., A. W., THE**, 232 N. Elm St., Waterbury, Conn. ADV. PG. 236.
Ⓥ**HAYDON MFG. CO., INC.**, 584 E. Elm St., Torrington, Conn. ADV. PG. 102, 103.
Lumenite Electric Co., 407 S. Dearborn St., Chicago, Ill.
Ⓥ**Photoswitch, Inc.**, 77 Broadway, Cambridge 42, Mass.
Ⓥ**POTTER INSTRUMENT CO., INC.**, 115 Cutter Mill Rd., Great Neck, N. Y. ADV. PG. 204.
Sessions Clock Co., Forestville, Conn.
Ⓥ**Sheffield Instrument Corp.**, 2021 N. Lincoln St., Burbank, Calif.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ**Special Instruments Laboratory, Inc.**, 1003 Highland Ave., Knoxville, Tenn.
Ⓥ**Standard Electric Time Co.**, 89 Logan St., Springfield, Mass.

INDICATORS—*Torque*

Ⓥ**Automatic Temperature Control Co., Inc.**, 5212 Pulaski Ave., Philadelphia 44, Pa.
Ⓥ**Baldwin Locomotive Works**, Philadelphia 42, Pa.
Ⓥ**Cole Instrument Co.**, 1320 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ**FLADER, INC., FREDERIC**, North Tonawanda, N. Y. ADV. PG. 240.
Ⓥ**Morrill & Morrill**, 30 Church St., New York 7, N. Y.

INDICATORS—*Turbidity*

Harshaw Scientific Div. of The Harshaw Chemical Co., 1945 E. 97th St., Cleveland 6, Ohio.

INDICATORS—*Vacuum*

Ⓥ**Automatic Temperature Control Co., Inc.**, 5212 Pulaski Ave., Philadelphia 44, Pa.
Ⓥ**Bailey Meter Co.**, 1044 Ivanhoe Rd., Cleveland 10, Ohio.
Ⓥ**Central Scientific Co.**, 1700 Irving Park Road, Chicago 13, Ill.
Ⓥ**Continental Electric Co.**, Geneva, Ill.
Ⓥ**Distillation Products Industries, Vacuum Equipment Div.**, 755 Ridge Rd., W., Rochester 3, N. Y.
Ⓥ**Foxboro Co., The**, Foxboro, Mass.
Ⓥ**Fredericks Co., Geo. E.**, Bethayres, Pa.
Harshaw Scientific Div. of The Harshaw Chemical Co., 1945 E. 97th St., Cleveland 6, Ohio.
Ⓥ**Hastings Instrument Co.**, Box 1275, Hampton, Va.
Ⓥ**Haydu Brothers**, Plainfield, N. J.
Ⓥ**Litton Industries**, San Carlos, Calif.
Ⓥ**Manning, Maxwell & Moore, Inc.**, Stratford, Conn.
Ⓥ**Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Roberts Aves.**, Philadelphia 44, Pa.
Ⓥ**National Research Corp.**, 70 Memorial Drive, Cambridge 42, Mass.
Ⓥ**Manufacturers Engr. & Equip. Corp.**, Willow Grove, Pa.
Nuremberg Thermometer Co., Inc., 4 Corey St., Boston 32, Mass.
Ⓥ**U. S. Gauge Div., American Machine & Metals, Inc.**, Sellersville, Pa.
Ⓥ**Wallace & Tiernan Products Inc.**, Belleville 9, N. J.
Ⓥ**Welch Scientific Co., W. M.**, 1515 Sedgwick St., Chicago 10, Ill.

INDICATORS—*Volume*

Ⓥ**Automatic Temperature Control Co., Inc.**, 5212 Pulaski Ave., Philadelphia 44, Pa.
Ⓥ**Daven Co.**, 191 Central Ave., Newark 4, N. J.
Ⓥ**Fairchild Recording Equipment Corp.**, 154 St. & 7th Avenue, Whitestone, N. Y.
Hart & Co., Inc., Frederick, 839 Main Ave., Poughkeepsie, N. Y.
Ⓥ**Triplett Electrical Instrument Co.**, 286 Harmon St., Bluffton, Ohio.
Ⓥ**U. S. Gauge Div., American Machine & Metals, Inc.**, Sellersville, Pa.

INDICATORS—*Weight*

Ⓥ**Automatic Temperature Control Co., Inc.**, 5212 Pulaski Ave., Philadelphia 44, Pa.
Ⓥ**Baldwin Locomotive Works**, Philadelphia 42, Pa.
Ⓥ**Cole Instrument Co.**, 1320 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ**FLADER, INC., FREDERIC**, North Tonawanda, N. Y. ADV. PG. 240.
Ⓥ**Foxboro Co., The**, Foxboro, Mass.
Ⓥ**Schaevitz Engineering, Crescent Blvd. at Drexel Ave.**, Pennsauken Township, Camden 11, N. J.
Ⓥ**Tracerlab, Inc.**, 130 High St., Boston 10, Mass.

ILLUMINATION CONTROLS

See Controls, Illumination

INDUCTION HEATING

See Heating, Induction

INDUCTORS

See Chokes and Coils, Choke

INFRA-RED DRYING OVENS

See Ovens

INSPECTION EQUIPMENT—*Lighting*

Ⓥ**Fostoria Pressed Steel Corp.**, Fostoria, Ohio.
Ⓥ**GENERAL ELECTRIC CO.**, Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.

INSTRUMENT PARTS—*Precision*

Ⓥ**ARMA CORP.**, 254 36th St., Brooklyn 32, N. Y. ADV. PG. 146.
Ⓥ**Bowen & Co., Inc.**, 4712 Bethesda Ave., Bethesda, Md.
Ⓥ**BRADLEY LABS., INC.**, 82 Meadow St., New Haven 10, Conn. ADV. PG. 152.
Ⓥ**CINEMA ENGINEERING CO.**, 1510 W. Verdugo Ave., Burbank, Calif. ADV. PG. 186.
Ⓥ**Citation Products Co.**, 233 E. 146th St., New York 51, N. Y.
Ⓥ**Cole Instrument Co.**, 1320 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ**Daven Co.**, 191 Central Ave., Newark 4, N. J.
Ⓥ**Eastern Specialty Co.**, Philadelphia 40, Pa.
Elm Laboratories, 18 South Broadway, Dobbs Ferry, N. Y.
Ⓥ**Farrand Optical Co., Inc.**, Bronx Blvd. at 238th St., New York 66, N. Y.
Felsenthal & Sons Inc., G., 4100 W. Grand Ave., Chicago 51, Ill.
Ⓥ**Fenner Co., R. Y.**, 110 Pleasant St., Malden, Mass.
Ⓥ**GENERAL ELECTRIC CO.**, Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ**Instrument Laboratories**, 315 W. Walton Place, Chicago 10, Ill.
Ⓥ**INSTRUMENT SPECIALTIES CO., INC.**, 254 Bergen Blvd., Little Falls, N. J. ADV. PG. 202.
Ⓥ**Lear, Inc.**, 110 Ionia Ave., N. W., Grand Rapids 2, Mich.
Ⓥ**McElroy Mfg. Corp.**, Littleton, Mass.
Ⓥ**MAKEPEACE CO., D. E.**, Attleboro, Mass. ADV. PG. 97.
Ⓥ**Manufacturers Thread Grinding Inc.**, P. O. Box 66, Eatontown, N. J.
Metropolitan Eelctronics & Instruments Co., 106 Fifth Ave., New York 11, N. Y.
Ⓥ**Molded Insulation Co.**, Aircraft Control Div., 335 E. Price St., Philadelphia, Pa.
Ⓥ**NEY CO., J. M.**, 179 Elm St., Hartford, Conn. ADV. PG. 142.
Ⓥ**Reeves Instrument Corp.**, 215 E. 91st Street, New York, N. Y.
Ⓥ**Rubicon Co.**, 3751 Ridge Ave., Philadelphia, Pa.
Ⓥ**Smith Inc., Herman H.**, 405 44th St., Brooklyn 20, N. Y.
Spaulding Fibre Co., 310 Wheeler St., Tonawanda, N. Y.
Ⓥ**Star Expansion Products Co.**, 147-149 Cedar St., New York 6, N. Y.
Ⓥ**SYLVANIA ELECTRIC PRODUCTS, INC.**, Emporium, Pa. ADV. PG. 286 to 290.
Ⓥ**Technology Instrument Corp.**, 1058 Main St., Waltham 54, Mass.
Ⓥ**Vallorbs Jewel Co.**, Lancaster, Pa.
VECTRON, INC., 235 High St., Waltham, Mass. ADV. PG. 266.
Ⓥ**Vibration Systems, Inc.**, 1040 W. Fort St., Detroit 26, Mich.

INSTRUMENTS—*Electronic Musical*

Ⓥ**Baldwin Locomotive Works**, Philadelphia 42, Pa.
Ⓥ**Conn Ltd., C. G., Electronics Div.**, Elkhart, Ind.
Ⓥ**Crystal Research Labs., Inc.**, 29 Allyn St., Hartford, Conn.
Ⓥ**Wurlitzer Co., Rudolph, The**, N. Tonawanda, N. Y.

INSTRUMENTS—*Graphic Recording*

Ⓥ**Acme Telectronix Div. of NEA Service, Inc.**, West Third & Lakeside, Cleveland 13, Ohio.
Ⓥ**ALDEN PRODUCTS CO.**, 117 No. Main St., Brockton 64, Mass. ADV. PG. 235.

1950-1951 DIRECTORY of

Ⓥ Indicates IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

Ⓥ Bailey Meter Co., 1044 Ivanhoe Rd., Cleveland 10, Ohio.
Ⓥ Baldwin Locomotive Works, Philadelphia 42, Pa.
Ⓥ BRUSH DEVELOPMENT CO., THE, 3405 Perkins Ave., Cleveland 14, Ohio. ADV. PG. 324, 325.
Ⓥ CENTURY GEOPHYSICAL CORP., 1311 N. Utica, Tulsa 9, Okla. ADV. PG. 237.
Ⓥ Consolidated Engineering Corp., 620 N. Lake Ave., Pasadena 4, Calif.
Ⓥ Edin Electronics Co., 207 Main St., Worcester, Mass. Electric Tachometer Corp., 2218 Vine St., Philadelphia 3, Pa.
Ⓥ Electronic Associates, Inc., Long Branch, N. J.
Ⓥ ELECTRONIC TUBE CORP., 1200 E. Mermaid Lane, Philadelphia 18, Pa. ADV. PG. 156.
Ⓥ Interstate Angus Co., Inc., P. O. Box 596, Indianapolis 6, Ind.
Ⓥ Farrand Optical Co., Inc., Bronx Blvd. at 238th St., New York 66, N. Y.
Ⓥ Fenlaw Electronics Inc., 1171 New York Ave., Huntington Station, N. Y.
Ⓥ FLADER, INC., FREDERICK, North Tonawanda, N. Y. ADV. PG. 248.
Ⓥ Foxboro Co., The, Foxboro, Mass.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 16.
Ⓥ Gorrell & Gorrell, Haworth, N. J.
Ⓥ Gross Instrument Co., 181 Old Colony Ave., Quincy, Mass.
Ⓥ RAY ELECTRIC CO., 14 Maple Ave., Pine Brook, N. J. ADV. PG. 193.
Ⓥ Measuring Mfg. Corp., Littleton, Mass.
Ⓥ Manning, Maxwell & Moore, Inc., Stratford, Conn.
Ⓥ Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Roberts Aves., Philadelphia 44, Pa.
Ⓥ Offner Electronics, Inc., 5320 N. Kedzie Ave., Chicago 25, Ill.
Ⓥ RAHM INSTRUMENTS, INC., 15 W. Broadway, New York 7, N. Y. ADV. PG. 170.
Ⓥ SANBORN CO., 39 Osborn St., Cambridge 39, Mass. ADV. PG. 219.
Ⓥ Servo, Inc., 41 Cambridge St., Boston, Mass.
Ⓥ SERVO-TEK PRODUCTS CO., 4 Godwin Ave., Paterson, N. J. ADV. PG. 187.
Ⓥ SOUND APPARATUS CO., Skilling, N. J. ADV. PG. 243.
Ⓥ Southwestern Industrial Electronics Co., 7831 Park Row Rd., Houston 24, Texas.
Ⓥ Special Instruments Laboratory, Inc., 1009 Highland Ave., Knoxville, Tenn.
Ⓥ Wallace & Tiernan Products Inc., Belleville 9, N. J.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.
Ⓥ Wheelco Instruments Co., 847 W. Harrison St., Chicago 7, Ill.

INSTRUMENTS—*Nuclear*

Ⓐ Atlas Electronic Laboratories, Inc., 1226-1248 Flushing Ave., Brooklyn 6, N. Y.
Ⓐ Beckman Instruments, Inc., 3900 Fullerton Rd., Fullerton, Calif.
Ⓐ Consolidated Engineering Corp., 620 N. Lake Ave., Pasadena 4, Calif.
Ⓐ ATOMIC INSTRUMENT CO., 160 Charles St., Boston, Mass. ADV. PG. 216.
Ⓐ Berkeley Scientific Co., Richmond, Calif.
Ⓐ CHATHAM ELECTRONICS CORP., 475 Washington St., Newark 2, N. J. ADV. PG. 226.
Ⓐ Electronic Corp., 11927 W. Pico Blvd., Los Angeles 64, Calif.
Ⓐ Ekco Products Ltd., 101-103 Windsor St., Halifax, N. S., Canada.
Electronic Products Co., 111 E. 8th St., Mt. Vernon, N. Y.
Ⓐ FL-TRONICS, INC., 1449 N. Howard St., New York 13, N. Y. ADV. PG. 238.
FLADER, INC., FREDERICK, North Tonawanda, N. Y. ADV. PG. 248.
Ⓐ GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 16.
Ⓐ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Ⓐ Kelley Koett Mfg., Instrument Div., 12 E. 4th St., Covington, Ky.
Ⓐ Manufacturers Engr. & Equip. Corp., Willow Grove, Pa.
Ⓐ National Technical Laboratories, 850 Mission St., South Pasadena, Calif.
Ⓐ North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
Ⓐ Nuclear Development Lab., P. O. Box 11514, Kansas City, Mo.
Ⓐ Nuclear Instrument & Chemical Corp., 223 W. Erie St., Chicago 10, Ill.
Ⓐ Nucleonic Corp. of America, The, 437 Osborn St., Brooklyn 12, N. Y.
Ⓐ POTTER INSTRUMENT CO., INC., 115 Cutter Mill Rd., Great Neck, N. Y. ADV. PG. 204.
Ⓐ Radiation Counter Laboratories, Inc., 1243 W. 51st St., Chicago 9, Ill.
Ⓐ RADIO CORP. OF AMERICA, RCA Victor Div., Camden, N. J. ADV. PG. 74 to 76.
Sheffer Sink and Rule Corp.
Ⓐ Radioactive Products, Inc., 5201 E. Woodbridge St., Detroit 7, Mich.
Sheraton Electronics Co., 1251 Flushing Ave., Brooklyn 6, N. Y.
Ⓐ Special Instruments Laboratory, Inc., 1009 Highland Ave., Knoxville, Tenn.
Ⓐ Standard Electronics Research Corp., 3 East End Ave., New York 21, N. Y.
Streeter-Amet Corp., 4101 N. Rivenwood Ave., Chicago 13, Ill.
Ⓐ Tracerlab, Inc., 130 High St., Boston 10, Mass.
Ⓐ Varian Associates, 99 Washington St., San Carlos, Calif.
Z & W Machine Products Inc., Electronics Div., 5151 St. Clair Ave., Cleveland 3, Ohio.

INSTRUMENTS—*Panel*

Ⓐ ART-LLOYD METAL PRODUCTS CORP., 2973 Cropsey Ave., Brooklyn 14, N. Y. ADV. PG. 272.
Ⓐ Assembly Products, Inc., Chagrin Falls 6, Ohio.
Austin Co., Inc., D., 345 Thomp Ave., Brooklyn 21, N. Y.
Ⓐ Bailey Meter Co., 1044 Ivanhoe Rd., Cleveland 10, Ohio.
Ⓐ Baldwin Locomotive Works, Philadelphia 42, Pa.
Ⓐ Beede Electrical Instrument Co., Penacook, N. H.
Ⓐ Burlington Instrument Co., Burlington, Iowa.
Ⓐ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Electric Design & Mfg. Corp., Burlington, Iowa.
Electro Mechanical Instrument Co., 812 Chestnut St., Perkasie, Pa.
Ⓐ FALSTROM CO., 44 Fairmon Court, Passaic, N. J. ADV. PG. 163.
Ⓐ Feiler Engineering Co., 1601 S. Federal St., Chicago 16, Ill.
Ⓐ FERRANTI ELECTRIC, INC., 30 Rockefeller Plaza, New York 20, N. Y. ADV. PG. 91.
Ⓐ Foreger & Porter Co., Hatboro, Pa.
Ⓐ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 16.
Ⓐ International Instruments, Inc., 331 East St., New Haven 11, Conn.
Ⓐ Lewis Engineering Co., 52 Rubber Ave., Naugatuck, Conn.
Ⓐ MARION ELECTRICAL INSTRUMENT CO., Manchester, N. H. ADV. PG. 130.
Meters, Inc., 915 Westfield Blvd., Indianapolis 20, Ind.
Ⓐ Minneapolis-Honeywell Regulator Co., 2753 Fourth Avenue S., Minneapolis, Minn.
Ⓐ G. V. S. Inc., 15 South Essex St., Orange, N. J.
Ⓐ Roller-Smith, Bethlehem, Pa.
Ⓐ Servo-Tek Research Instrument Corp., 9 Elm Ave., Mt. Vernon, N. Y.
Ⓐ Sheffield Instrument Corp., 2021 N. Lincoln St., Burbank, Calif.
Simpson Electric Co., Div. of American Gage & Machine Co., 5208 W. Kinzie St., Chicago 44, Ill.
Ⓐ Tinsley Electrical Instrument Co., 786 Harmon Rd., Bluffton, Ohio.
Ⓐ Welch Scientific Co., W. M., 1515 Sedgwick St., Chicago 10, Ill.
Ⓐ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Ⓐ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.
Ⓐ Wheelco Instruments Co., 847 W. Harrison St., Chicago 7, Ill.

INSTRUMENTS—*Ultrasonic*

Ⓐ Branson Instruments, Inc., 438 Fairfield Ave., Stamford, Conn.
Ⓐ BRUSH DEVELOPMENT CO., 3405 Perkins Ave., Cleveland 14, Ohio. ADV. PG. 324, 325.
Ⓐ CLARK CRYSTAL CO., 2 Farm Rd., Marlboro, Mass. ADV. PG. 210.
Ⓐ Crystal Research Labs., Inc., 29 Allyn St., Hartford, Conn.
Ⓐ Fisher Scientific Co., 717 Forbes St., Pittsburgh 19, Pa.
Ⓐ FREED TRANSFORMER CO., INC., 1736 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 143.
Ⓐ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Ⓐ PANORAMIC RADIO PRODUCTS, INC., 10 South Second Ave., Mt. Vernon, N. Y. ADV. PG. 270.
Ⓐ Photocon Research Products, 1062 N. Allen Ave., Pasadena 7, Calif.
Ⓐ Plaza Products Co., Whitney St., Framingham, Mass.
Sheraton Electronics Co., 1251 Flushing Ave., Brooklyn 6, N. Y.
Ⓐ SPERRY PRODUCTS, INC., Danbury, Conn. ADV. PG. 53.
Ⓐ Technology Instrument Corp., 1066 Main St., Waltham 54, Mass.
Ⓐ Tinsley & Burton, Inc., 831 N. Lake St., Burbank, Calif.
Ⓐ Vitrex Crystals, Highland St., Holliston, Mass.

INSULATING COMPOUNDS
Asphalts

Ⓐ BIWAX CORP., 3445 Howard St., Skokie, Ill. ADV. PG. 242.
Ⓐ Boerring Co., Inc., George C., P. O. Box 115, East Rutherford, N. J.
Ⓐ Dolph Co., John C., Monmouth Junction, N. J.
Ⓐ Horn Co., Inc., A. C., 10th St. & 44th Ave., Long Island City 1, N. Y.
Ⓐ John Manville, 22 E. 40th St., New York 16, N. Y.
Ⓐ MITCHELL RAND INSULATION CO., INC., 51 Murray St., New York 7, N. Y. ADV. PG. 92.
Ⓐ Sherwin-Williams Co., 101 Prospect Ave., N. W., Cleveland 1, Ohio.
Ⓐ Standard Varnish Works, 2600 Richmond Terrace, Staten Island 3, N. Y.
Ⓐ ZOPHAR MILLS, INC., 112-130 26th St., Brooklyn 32, N. Y. ADV. PG. 192.

Coil Dopes

Ⓐ Acme Wire Co., New Haven 14, Conn.
Ⓐ Boerring Co., Inc., George C., P. O. Box 115, East Rutherford, N. J.
Ⓐ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
Ⓐ Halowax Products Division, Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y.
Ⓐ INSL-X CO., INC., THE, Water St. & Broadway, Ossining, N. Y. ADV. PG. 256.
Ⓐ Schenectady Varnish Co., Schenectady, N. Y.
Ⓐ Sherwin-Williams Co., 101 Prospect Ave., N. W., Cleveland 1, Ohio.
Ⓐ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

Enamel

Ⓐ Acme Wire Co., New Haven 14, Conn.
Ⓐ Bakelite Div., Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y.
Ⓐ Boerring Co., Inc., George C., P. O. Box 115, East Rutherford, N. J.
Ⓐ du Pont de Nemours & Co., Inc., E. I., Wilmington, Delaware.
Ⓐ Horn Co., Inc., A. C., 10th St. & 44th Ave., Long Island City 1, N. Y.
Ⓐ Mass & Waldstein Co., 438 Riverside Ave., Newark 4, N. J.
Ⓐ Schenectady Varnish Co., Schenectady, N. Y.
Ⓐ Sherwin-Williams Co., 101 Prospect Ave., N. W., Cleveland, Ohio.
Ⓐ Standard Varnish Works, 2600 Richmond Terrace, Staten Island 3, N. Y.

Impregnating Compounds

Ⓐ Acme Wire Co., New Haven 14, Conn.
American Products Mfg. Corp., Oleander & Dublin Sts., New Orleans 18, La.
Ⓐ Bakelite Div., Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y.
Ⓐ BIWAX CORP., 3445 Howard St., Skokie, Ill. ADV. PG. 242.
Ⓐ Boerring Co., Inc., George C., P. O. Box 115, East Rutherford, N. J.
Ⓐ Dolph Co., John C., Monmouth Junction, N. J.
Ⓐ Durez Plastics & Chemicals, Inc., 1921 Walck Rd., N. Tonawanda, N. Y.
Ⓐ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
Ⓐ GENERAL ELECTRIC CO., Chemical Dept., Pittsfield, Mass. ADV. PG. 5 to 16.
George Dr., P. O., 4200 N. 2nd Street, St. Louis, Mo.
Ⓐ Halowax Products Division, Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y.
Ⓐ INSL-X CO., INC., THE, Water St. & Broadway, Ossining, N. Y. ADV. PG. 256.
Ⓐ Irvington Varnish & Insulator Co., 10 Argyle Terrace, Irvington 11, N. J.
Ⓐ MITCHELL RAND INSULATION CO., INC., 51 Murray St., New York 7, N. Y. ADV. PG. 92.
Ⓐ Reichhold Chemicals, Inc., 601-701 Woodward Heights Blvd., Detroit 20, Mich.
Ⓐ Sauereisen Cements Co., Sauereisen Bldg., Pittsburgh 15, Pa.
Ⓐ SCHENECTADY VARNISH CO., Schenectady, N. Y.
Ⓐ Sherwin-Williams Co., 101 Prospect Ave., N.W., Cleveland 1, Ohio.
Ⓐ Standard Varnish Works, 2600 Richmond Terrace, Staten Island 3, N. Y.
Ⓐ Tennessee Corp. & Subs., 110 Race Street, Phila. 6, Pa.
Ⓐ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Ⓐ ZOPHAR MILLS, INC., 112-130 26th St., Brooklyn 32, N. Y. ADV. PG. 192.

Insulating Varnish

Ⓐ Acme Wire Co., New Haven 14, Conn.
American Products Mfg. Corp., Oleander & Dublin Sts., New Orleans 18, La.
Ⓐ Bakelite Div., Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y.
Ⓐ Boerring Co., Inc., George C., P. O. Box 115, East Rutherford, N. J.
Ⓐ Communication Products Co., Inc., Broadway & Clark St., Keyport, N. J.
Ⓐ Dolph, John C., Monmouth Junction, N. J.
Ⓐ Dow Corning Corp., Midland, Mich.
Ⓐ du Pont de Nemours & Co., Inc., E. I., Wilmington, Delaware.

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

Ⓥ Durez Plastics & Chemicals, Inc., 1921 Walck Rd., N. Tonawanda, N. Y.
Ⓥ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
Ⓥ GENERAL ELECTRIC CO., Chemical Dept., Pittsfield, Mass. ADV. PG. 5 to 18.
George C. P. D., 5200 N. Second St., St. Louis, Mo.
Ⓥ Horn Co., Inc., A. C., 10th St. & 44th Ave., Long Island City 1, N. Y.
Ⓥ INSL-X CO., THE, Water St. & Broadway, Ossining, N. Y. ADV. PG. 256.
Ⓥ Irvington Varnish & Insulator Co., 10 Argyle Terrace, Irvington 11, N. J.
Ⓥ Maas & Waldstein Co., 438 Riverside Ave., Newark 4, N. J.
Ⓥ MICA INSULATOR CO., Schenectady 1, N. Y. ADV. PG. 232.
Ⓥ MITCHELL-RAND INSULATION CO., INC., 51 Murray St., New York 7, N. Y. ADV. PG. 92.
Ⓥ Reichhold Chemicals, Inc., 601-707 Woodward Heights Blvd., Detroit 20, Mich.
Ⓥ SCHENECTADY VARNISH CO., Schenectady, N. Y.
Ⓥ Sherwin-Williams Co., 101 Prospect Ave., N.W., Cleveland 1, Ohio.
Ⓥ Standard Varnish Works, 2600 Richmond Terrace, Staten Island 3, N. Y.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

Lacquer

Ⓥ Acme Wire Co., New Haven 14, Conn.
American Products Mfg. Corp., Oleander & Dublin Sts., New Orleans 18, La.
Ⓥ Bakelite Div., Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y.
Ⓥ Borthig Co., Inc., George C., P. O. Box 115, East Rutherford, N. J.
Ⓥ Communication Products Co., Inc., Broadway & Clark St., Keyport, N. J.
Ⓥ Dolph Co., John C., Monmouth Junction, N. J.
Ⓥ Du Pont de Nemours & Co., Inc., E. I., Wilmington, Delaware
Ⓥ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
Ⓥ Horn Co., Inc., A. C., 10th St. & 44th Ave., Long Island City 1, N. Y.
Ⓥ INSL-X CO., INC., THE, Water St. & Broadway, Ossining, N. Y. ADV. PG. 256.
Ⓥ Irvington Varnish & Insulation Co., 10 Argyle Terrace, Irvington 11, N. J.
Ⓥ Maas & Waldstein Co., 438 Riverside Ave., Newark 4, N. J.
Ⓥ MICRO-CIRCUITS CO., New Buffalo, Mich. ADV. PG. 222.
Ⓥ Sherwin-Williams Co., 101 Prospect Ave., N.W., Cleveland 1, Ohio.
Ⓥ Standard Varnish Works, 2600 Richmond Terrace, Staten Island 3, N. Y.

Phenolic Molding Compounds

Ⓥ Bakelite Div., Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y.
Ⓥ Durez Plastics & Chemicals, Inc., 1921 Walck Rd., N. Tonawanda, N. Y.
Ⓥ GENERAL ELECTRIC CO., Chemical Dept., Pittsfield, Mass. ADV. PG. 5 to 18.
Ⓥ Irvington Varnish & Insulation Co., 10 Argyle Terrace, Irvington 11, N. J.
Ⓥ Monsanto Chemical Co., Plastics Div., Springfield 2, Mass.
Ⓥ Pluskon Division, Libbey-Owens-Ford Glass Co., 2112-24 Sylvan Ave., Toledo 6, Ohio.
Ⓥ Reilly Tar & Chemical Corp., 1615 Merchants Bank Bldg., 11 S. Meridian St., Indianapolis, Ind.
Ⓥ Rogers Corp., Manchester, Conn.

Pitch

Ⓥ BIWAX CORP., 3445 Howard St., Skokie, Ill. ADV. PG. 242.
Ⓥ MITCHELL-RAND INSULATION CO., INC., 51 Murray St., New York 7, N. Y. ADV. PG. 92.
Ⓥ Reilly Tar & Chemical Corp., 1615 Merchants Bank Bldg., 11 S. Meridian St., Indianapolis, Ind.
Ⓥ Sherwin-Williams Co., 101 Prospect Ave., N.W., Cleveland 1, Ohio.
Ⓥ ZOPHAR MILLS, INC., 112-130 26th St., Brooklyn 32, N. Y. ADV. PG. 192.

Protective Sealers

Ⓥ Bakelite Div., Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y.
Ⓥ Borthig Co., Inc., George C., P. O. Box 115, East Rutherford, N. J.
Ⓥ GENERAL ELECTRIC CO., Chemical Dept., Pittsfield, Mass. ADV. PG. 5 to 18.
George C. P. D., 5200 N. 2nd Street, St. Louis, Mo.
Ⓥ Halowax Products Division, Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y.
Ⓥ INSL-X CO., INC., THE, Water St. & Broadway, Ossining, N. Y. ADV. PG. 256.
Ⓥ Irvington Varnish & Insulator Co., 10 Argyle Terrace, Irvington 11, N. J.
Ⓥ Schenectady Varnish Co., Schenectady, N. Y.
Ⓥ Sherwin-Williams Co., 101 Prospect Ave., N.W., Cleveland 1, Ohio.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Ⓥ ZOPHAR MILLS, INC., 112-130 26th St., Brooklyn 32, N. Y. ADV. PG. 192.

Resins

Ⓥ Bakelite Div., Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y.
Ⓥ BIWAX CORP., 3445 Howard St., Skokie, Ill. ADV. PG. 242.
Ⓥ Catalin Corp. of America, 1 Park Ave., New York 16, N. Y.
Ⓥ Dow Chemical Co., Midland, Mich.
Ⓥ Dow Corning Corp., Midland, Mich.
Ⓥ Durez Plastics & Chemicals, Inc., 1921 Walck Rd., N. Tonawanda, N. Y.
Ⓥ GENERAL ELECTRIC CO., Chemical Dept., Pittsfield, Mass. ADV. PG. 5 to 18.
Ⓥ Goodyear Tire & Rubber Co., Inc., Chemical Div., 1144 E. Market St., Akron 16, Ohio.
Ⓥ Halowax Products Division, Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y.
Ⓥ Irvington Varnish & Insulator Co., 10 Argyle Terrace, Irvington 11, N. J.
Ⓥ Marbon Corp., Gary, Indiana.
Ⓥ Monsanto Chemical Co., Plastics Div., Springfield 2, Mass.
Ⓥ Paisley Products, Inc., 1770 Canalport Ave., Chicago 16, Ill.
Ⓥ Reichhold Chemicals, Inc., 601-707 Woodward Heights Blvd., Detroit 20, Mich.
Ⓥ Schenectady Varnish Co., Schenectady, N. Y.
Ⓥ Sherwin-Williams Co., 101 Prospect Ave., N.W., Cleveland 1, Ohio.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Ⓥ ZOPHAR MILLS, INC., 112-130 26th St., Brooklyn 32, N. Y. ADV. PG. 192.

Silicone Compounds

Ⓥ Connecticut Hard Rubber Co., 407 East St., New Haven 9, Conn.
Ⓥ Dow Corning Corp., Midland, Mich.
Ⓥ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
Ⓥ GENERAL ELECTRIC CO., Chemical Dept., Pittsfield, Mass. ADV. PG. 5 to 18.
Ⓥ Irvington Varnish & Insulation Co., 10 Argyle Terrace, Irvington 11, N. J.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

Varnish Cambric Coatings

Ⓥ Acme Wire Co., New Haven 14, Conn.
Ⓥ Bakelite Div., Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y.
Ⓥ Dielectric Materials Co., 5315-17 N. Ravenswood Ave., Chicago 40, Ill.
Ⓥ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
George C. P. D., 5200 N. 2nd St., St. Louis, Mo.
Ⓥ Irvington Varnish & Insulator Co., 10 Argyle Terrace, Irvington 11, N. J.
Ⓥ MICA INSULATOR CO., Schenectady 1, N. Y. ADV. PG. 232.
Ⓥ Schenectady Varnish Co., Schenectady, N. Y.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

Waxes

Ⓥ BIWAX CORP., 3445 Howard St., Skokie, Ill., ADV. PG. 242.
Ⓥ Durez Plastics & Chemicals, Inc., 1921 Walck Rd., N. Tonawanda, N. Y.
Ⓥ GENERAL ELECTRIC CO., Chemical Dept., Pittsfield, Mass. ADV. PG. 5 to 18.
Ⓥ Glyco Products Co., Inc., 26 Court St., Brooklyn, N. Y.
Ⓥ Halowax Products Division, Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, New York.
Ⓥ Horn Co., Inc., A. C., 10th St., & 44th Ave., Long Island City 1, N. Y.
Insulatine Co., 1 Broadway, New York, N. Y.
Ⓥ MITCHELL-RAND INSULATION CO., INC., 51 Murray Street, New York 7, N. Y. ADV. PG. 92.
Ⓥ Standard Varnish Works, 2600 Richmond Terrace, Staten Island 3, N. Y.
Ⓥ Stevenson Bro. & Co., 110 Race St., Philadelphia 6, Pa.
Ⓥ ZOPHAR MILLS, INC., 112-130 26th St., Brooklyn 32, N. Y. ADV. PG. 192.

INSULATION MATERIALS

Aluminum Oxide

Ⓥ Aluminum Co. of America, Gulf Bldg., Pittsburgh, Pa.
Ⓥ AMERICAN LAVA CORP., Chattanooga 5, Tenn. ADV. PG. 27.
Ⓥ Kaiser Aluminum & Chemical Sales, Inc., 1924 Broadway, Oakland 12, Calif.
Ⓥ Merck & Co., Inc., Rahway, N. J.
Ⓥ Norton Co., 1 New Bond St., Worcester 6, Mass.
Ⓥ Star Porcelain Co., 61 Muirhead Ave., Trenton 9, N. J.

Asbestos

Dobeckmun Co., The, Industrial Prods. Div., Cleveland 1, Ohio.
Ⓥ Formica Co., The, 4640 Spring Grove Ave., Cincinnati 32, Ohio.
Ⓥ Irvington Varnish & Insulator Co., 10 Argyle Terrace, Irvington 11, N. J.
Ⓥ Johns-Manville, 22 E. 40th St., New York 16, N. Y.
Ⓥ Keasbey & Mattison, Ambler, Pa.
Ⓥ MITCHELL-RAND INSULATION CO., INC., 51 Murray St., New York 7, N. Y. ADV. PG. 92.
Ⓥ Powhatan Mining Co., Baltimore 7, Md.

Bead

Ⓥ AMERICAN LAVA CORP., Chattanooga 5, Tenn. ADV. PG. 27.
Ⓥ Isolantite Mfg. Corp., Stirling, N. J.
Ⓥ Steward Mfg. Co., D. M., Chattanooga, Tenn.

Ceramic

Ⓥ Akron Porcelain Co., Akron 14, Ohio.
Ⓥ AMERICAN LAVA CORP., Chattanooga 5, Tenn. ADV. PG. 27.
Ⓥ CENTRALAB, DIV. of Globe Union Inc., 900 E. Keefe Ave., Milwaukee 1, Wis. ADV. PG. 64, 65.
Ⓥ Colonial Insulator Co., The, 907 Grant St., Akron 11, Ohio.
Ⓥ Crowley & Co., Inc., Henry L., 1 Central Ave., West Orange, N. J.
Ⓥ GENERAL CERAMICS & STEATITE CORP., Keasbey, N. J. ADV. PG. 219.
Ⓥ Isolantite Mfg. Corp., Stirling, N. J.
Ⓥ Kirchberger & Co., Inc., M., 1425 37th St., Brooklyn 18, N. Y.
Ⓥ Lapp Insulator Co., Inc., Radio Specialties Div., 31 Gilbert St., Le Roy, N. Y.
Ⓥ Locke Incorporated, P. O. Box 57, Baltimore 1, Md.
Ⓥ Loutban Mfg. Co., East Liverpool, Ohio.
Ⓥ MYCALEX CORP. OF AMERICA, 60 Clifton Blvd., Clifton, N. J. ADV. PG. 163.
Ⓥ Star Porcelain Co., 61 Muirhead Ave., Trenton, N. J.
Ⓥ Steward Mfg. Co., D. M., Chattanooga, Tenn.
Ⓥ STUPAKOFF CERAMIC & MFG. CO., Latrobe, Pa. ADV. PG. 147.
Ⓥ Thor Ceramics Inc., 225 Belleville Ave., Bloomfield, N. J.

Fabric

Ⓥ Acme Wire Co., New Haven 14, Conn.
Ⓥ BRAND & CO., WM., Willimantic, Conn. ADV. PG. 120, 121.
Ⓥ Franklin Fibre-Lamitex Corp., 12th and French Sts., Wilmington, Del.
Ⓥ Minnesota Mining & Mfg. Co., 900 Fauquier Ave., St. Paul, Minn.
Ⓥ MITCHELL RAND INSULATION CO., INC., 51 Murray St., New York 7, N. Y. ADV. PG. 92.
Ⓥ NATIONAL VARNISHED PRODUCTS CORP., THE, 211 Randolph Ave., Woodbridge, N. J. ADV. PG. 248.
Ⓥ RICHARDSON CO., THE, 2767 Lake St., Melrose Park, Ill. ADV. PG. 144.

Fibre

Ⓥ Baer Co., N. S., 9 Montgomery St., Hillside, N. J.
Ⓥ BRAND & CO., WM., Willimantic, Conn. ADV. PG. 120, 121.
Brandywine Fibre Co., 15th & Poplar Sts., Wilmington, Del.
Ⓥ Continental Diamond Fibre Co., 16 Chapel St., Newark 16, Del.
Franklin Fibre-Lamitex Corp., 12th and French Sts., Wilmington, Del.
Ⓥ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
Ⓥ Lamicoid Fabricators, Inc., 4545 W. Cortland St., Chicago 39, Ill.
Ⓥ MICA INSULATOR CO., Schenectady 1, N. Y. ADV. PG. 232.
Ⓥ Minnesota Mining & Mfg. Co., 900 Fauquier Ave., St. Paul, Minn.
Ⓥ MITCHELL RAND INSULATION CO., INC., 51 Murray St., New York 7, N. Y. ADV. PG. 92.
Ⓥ NATIONAL VULCANIZED FIBRE CO., Wilmington, Del. ADV. PG. 183.
Ⓥ RICHARDSON CO., THE, 2767 Lake St., Melrose Park, Ill. ADV. PG. 144.
Ⓥ Rogers Corp., Manchester, Conn.
Spaulding Fibre Co., Inc., 310 Wheeler St., Tonawanda, N. Y.
Ⓥ Taylor Fibre Co., Norristown, Pa.
Ⓥ Wilmington Fibre Specialty Co., P. O. Drawer 1028, Wilmington 99, Del.

(V) indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

Glass

(V) BRAND & CO., WM., Willimantic, Conn. ADV. PG. 120, 121.
(V) CORNING GLASS WORKS, Corning, N. Y. ADV. PG. 134.
(V) HERMETIC SEAL PRODUCTS CO., 29-37 S. 6th St., Newark 7, N. J. ADV. PG. 87.
(V) Minnesota Mining & Mfg. Co., 900 Fauquier Ave., St. Paul, Minn.
(V) MITCHELL RAND INSULATION CO., INC., 51 Murray St., New York 7, N. Y. ADV. PG. 92.
(V) NATIONAL VARNISHED PRODUCTS CORP., THE, 211 Randolph Ave., Woodbridge, N. J. ADV. PG. 248.
(V) Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Polan Industries, 220 Eighth St., Huntington, West Virginia.
(V) STUPAKOFF CERAMIC & MFG. CO., Latrobe, Pa. ADV. PG. 147.
(V) Wheaton Co., T. C., Industrial Div., 220 S. St., Millville, N. J.

Glass Bonded Mica

(V) Electronic Mechanics, Inc., 70 Clifton Blvd., Clifton, N. J.
(V) GENERAL ELECTRIC CO., Chemical Dept., Pittsfield, Mass. ADV. PG. 5 to 18.
(V) Hyde Liberty Mica Co., 171 Camden St., Boston, Mass.
(V) MYCALEX CORP. OF AMERICA, 60 Clifton Blvd., Clifton, N. J. ADV. PG. 143.
(V) Mykroy, Inc., Arlington Heights Airport, Arlington Heights, Ill.

Glass Fibre

(V) Acme Wire Co., New Haven 14, Conn.
(V) Baer Co., N. S., 9 Montgomery St., Hillside, N. J.
(V) BRAND & CO., WM., Willimantic, Conn. ADV. PG. 120, 121.
(V) Continental Diamond Fibre Co., 16 Chapel St., Newark 16, Delaware.
Dielectric Materials Co., 5319-27 N. Ravenswood Ave., Chicago 40, Ill.
(V) Formica Co., The, 4640 Spring Grove Ave., Cincinnati 32, Ohio.
(V) Franklin Fibre-Lamitex Corp., 17th and French Sts., Wilmington, Delaware.
(V) Irvington Varnish & Insulator Co., 10 Argyle Terrace, Irvington 11, N. J.
(V) MICA INSULATOR CO., Schenectady 1, N. Y. ADV. PG. 232.
(V) Owens-Corning Fiberglas Corp., Textile Products Div., 16 E. 56th St., New York 22, N. Y.
Spaulding Fibre Co., Inc., 310 Wheeler St., Tonawanda, N. Y.

Glass Mica—Woven or Laminated

(V) Continental Diamond Fibre Co., 16 Chapel St., Newark 16, Delaware.
(V) Hyde Liberty Mica Co., 171 Camden St., Boston, Mass.
(V) Insulation Manufacturers Corp., 565 W. Washington Blvd., Chicago 6, Ill.
(V) Irvington Varnish & Insulator Co., 10 Argyle Terrace, Irvington 11, N. J.
(V) MITCHELL RAND INSULATION CO., INC., 51 Murray St., New York 7, N. Y. ADV. PG. 92.
(V) Mykroy, Inc., Arlington Heights Airport, Arlington Heights, Ill.
(V) National Electric Coil Co., Columbus 16, Ohio.

Laminates, Woven Glass

(V) Baer Co., N. S., 9 Montgomery St., Hillside, N. J.
(V) Connecticut Hard Rubber Co., 407 East St., New Haven 9, Conn.
(V) Continental Diamond Fibre Co., 16 Chapel St., Newark 16, Delaware.
(V) Formica Co., The, 4640 Spring Grove Ave., Cincinnati 32, Ohio.
(V) Irvington Varnish & Insulator Co., 10 Argyle Terrace, Irvington 11, N. J.
(V) Lamicoid Fabricators, Inc., 4545 W. Cortland St., Chicago 39, Ill.
Laminated Plastics, Inc., 14818 Euclid Ave., Cleveland 12, Ohio.
(V) MICA INSULATOR CO., Schenectady 1, N. Y. ADV. PG. 232.
(V) National Electric Coil Co., Columbus 16, Ohio.
(V) NATIONAL VULCANIZED FIBRE CO., Wilmington, Del. ADV. PG. 183.
(V) Owens-Corning Fiberglas Corp., Textile Products Div., 16 E. 56th St., New York 22, N. Y.
(V) Panelyte Div., St. Regis Paper Co., 230 Park Ave., New York, N. Y.
(V) RICHARDSON CO., THE, 4747 Lake St., Melrose Park, Ill. ADV. PG. 144.
Spaulding Fibre Co., Inc., 310 Wheeler St., Tonawanda, N. Y.
(V) Synthane Corp., Oaks, Pa.
(V) Taylor Fibre Co., Norristown, Pa.

Mica

(V) BRAND & CO., WM., Willimantic, Conn. ADV. PG. 120, 121.
(V) Continental Diamond Fibre Co., 16 Chapel St., Newark 16, Delaware.
(V) GENERAL ELECTRIC CO., Chemical Dept., Pittsfield, Mass. ADV. PG. 5 to 18.
(V) Hyde Liberty Mica Co., 171 Camden St., Boston, Mass.
(V) Irvington Varnish & Insulator Co., 10 Argyle Terrace, Irvington 11, N. J.
(V) Macalloy Co., The, 16 Macallen St., Boston 27, Mass.
(V) MICA INSULATOR CO., Schenectady 1, N. Y. ADV. PG. 232.
Micacraft Products Inc., 701 McCarter Highway, Newark 5, N. J.
(V) MITCHELL-RAND INSULATION CO., INC., 51 Murray St., New York 7, N. Y. ADV. PG. 92.

Paper

(V) Acme Wire Co., New Haven 14, Conn.
Aldine Paper Co., Inc., 535 5th Ave., New York 17, N. Y.
Central Paper Co., Inc., 2400 Lakeshore Drive, Muskegon, Mich.
Dobeckmun Co., Industrial Products Div., Cleveland 1, Ohio.
(V) Hollingsworth & Vose Co., East Walpole, Mass.
(V) Irvington Varnish & Insulator Co., 10 Argyle Terrace, Irvington 11, N. J.
(V) Johns-Manville, 22 E. 40th St., New York 16, N. Y.
(V) Minnesota Mining & Mfg. Co., 900 Fauquier Ave., St. Paul, Minn.
(V) Moore Co., Howard J., 108 Park Row, New York 7, N. Y.
(V) Mosinee Paper Mills Co., Mosinee, Wis.
(V) Rogers Corp., Manchester, Conn.
(V) Schweitzer, Inc., Peter J., 405 Lexington Ave., New York 17, N. Y.
(V) Smith Paper, Inc., Lee, Mass.
(V) Taylor Fibre Co., Norristown, Pa.
Willard's, Hampden, Mass.

Plastic

See Plastic Materials

Rubber

(V) American Hard Rubber Co., 11 Mercer St., New York 13, N. Y.
(V) Armstrong Cork Co., Lancaster, Pa.
(V) ATLANTIC INDIA RUBBER WORKS, INC., 571 W. Polk St., Chicago 7, Ill. ADV. PG. 271.
(V) Connecticut Hard Rubber Co., 407 East St., New Haven 9, Conn.
(V) GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
(V) General Tire & Rubber Co., The, Silentbloc Div., Wabash, Ind.
(V) Irvington Varnish & Insulator Co., 10 Argyle Terrace, Irvington 11, N. J.
Loewe Rubber Co., Muirhead Ave., Trenton, N. J.
(V) Marbon Corp., Gary, Indiana.
(V) Minnesota Mining & Mfg. Co., 900 Fauquier Ave., St. Paul, Minn.
(V) Rubber Corp., 1230 Avenue of the Americas, New York 20, N. Y.

Rubber—Conductive

(V) American Hard Rubber Co., 11 Mercer St., New York 13, N. Y.
(V) General Tire & Rubber Co., The, Silentbloc Div., Wabash, Ind.

Steatite

(V) AMERICAN LAVA CORP., Chattanooga 5, Tenn. ADV. PG. 27.
(V) CENTRALAB DIV., of Globe Union, Inc., 900 E. Keefe Ave., Milwaukee 1, Wis. ADV. PG. 64, 65.
(V) Crowley & Co., Inc., Henry L., 1 Central Ave., West Orange, N. J.
(V) GENERAL CERAMICS & STEATITE CORP., Keasbey, N. J. ADV. PG. 219.
(V) Haldor Bushing & Terminal Co., Inc., P. O. Box 91, Orange, N. J.
(V) Isolantite Mfg. Co., Stirling, N. J.
(V) Kirchberger & Co., Inc., M., 1425 37th St., Brooklyn 18, N. Y.
(V) Lapp Insulator Co., Inc., Radio Specialties Div., 31 Gilbert St., LeRoy, N. Y.
(V) Lauthan Mfg. Co., East Liverpool, Ohio.
(V) Star Porcelain Co., 61 Muirhead Ave., Trenton 9, N. J.
(V) Steward Mfg. Co., D. M., Chattanooga, Tenn.
(V) STUPAKOFF CERAMIC & MFG. CO., Latrobe, Pa. ADV. PG. 147.
(V) Thor Ceramics Inc., 225 Belleville Ave., Bloomfield, N. J.

INSULATION PARTS

Bead Insulation Parts

(V) AMERICAN LAVA CORP., Chattanooga 5, Tenn. ADV. PG. 27.
(V) CENTRALAB DIV., of Globe Union, Inc., 900 E. Keefe Ave., Milwaukee 1, Wis. ADV. PG. 64, 65.
(V) CORNING GLASS WORKS, Corning, N. Y. ADV. PG. 134.
(V) Crane Packing Co., 1800 Cuyler Ave., Chicago 13, Ill.
(V) GENERAL CERAMICS & STEATITE CORP., Keasbey, N. J. ADV. PG. 219.
(V) HERMETIC SEAL PRODUCTS CO., 29-37 South 6th St., Newark 7, N. J. ADV. PG. 87.
(V) Isolantite Mfg. Corp., Stirling, N. J.
(V) Kirchberger & Co., Inc., M., 1425 37th St., Brooklyn 18, N. Y.
(V) Laconia Corp., 37 S. 6th St., Newark 7, N. J.
(V) Mykroy, Inc., Arlington Heights Airport, Arlington Heights, Ill.
(V) Star Porcelain Co., 61 Muirhead Ave., Trenton 9, N. J.
Steward Mfg. Co., D. M., Chattanooga, Tenn.
(V) STUPAKOFF CERAMIC & MFG. CO., Latrobe, Pa. ADV. PG. 147.
(V) Waterbury Companies, Inc., Waterbury 90, Conn.
(V) Wheaton Co., T. C., Industrial Div., 220 S. St., Millville, N. J.
(V) Wisconsin Porcelain Co., Sun Prairie, Wis.

Capacitor Boxes

Acme Folding Box Co., Inc., 149 E. 25th St., New York, N. Y.
(V) Moore Co., Howard J., 108 Park Row, New York 7, N. Y.

Capacitor Films

Mica Fabricating Co., 53 Central Ave., Rochelle Park, N. J.
(V) MICA INSULATOR CO., Schenectady 1, N. Y. ADV. PG. 232.
(V) Micacraft Products, Inc., 701 McCarter Highway, Newark 5, N. J.

Ceramic Insulation Parts

(V) AMERICAN LAVA CORP., Chattanooga 5, Tenn. ADV. PG. 27.
(V) CENTRALAB DIV., OF GLOBE UNION, INC., 900 E. Keefe Ave., Milwaukee 1, Wis. ADV. PG. 64, 65.
(V) Crowley & Co., Inc., Henry L., 1 Central Ave., West Orange, N. J.
Electronic Mechanics, Inc., 70 Clifton Blvd., Clifton, N. J.
(V) GENERAL CERAMICS & STEATITE CORP., Keasbey, N. J. ADV. PG. 219.
(V) Hallett Mfg. Co., 1601 Florence Ave., Inglewood, Calif.
(V) Haldor Bushing & Terminal Co., Inc., P. O. Box 91, Orange, N. J.
(V) Isolantite Mfg. Corp., Stirling, N. J.
(V) Kirchberger & Co., Inc., M., 1425 37th St., Brooklyn 18, N. Y.
(V) Laconia Corp., 37 S. 6th St., Newark 7, N. J.
(V) Lapp Insulator Co., Inc., Radio Specialties Div., 31 Gilbert St., Le Roy, N. Y.
(V) Locke Incorporated, P. O. Box 57, Baltimore 3, Md.
Lauthan Mfg. Co., East Liverpool, Ohio.
Mica Fabricating Co., 53 Central Ave., Rochelle Park, N. J.
(V) Mykroy, Inc., Arlington Heights Airport, Arlington Heights, Ill.
(V) RADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75. Inside Back and Back Covers.
(V) Scintilla-Magneto Div. of Bendix Aviation Corp., Sidney, N. Y.
(V) Star Porcelain Co., 61 Muirhead Ave., Trenton 9, N. J.
(V) Steward Mfg. Co., D. M., Chattanooga, Tenn.
(V) STUPAKOFF CERAMIC & MFG. CO., Latrobe, Pa. ADV. PG. 147.
(V) Thor Ceramics Inc., 225 Belleville Ave., Bloomfield, N. J.
(V) Wind Turbine Co., Tower & Antenna Div., E. Market St. & Penna. R. R., West Chester, Pa.
(V) Wisconsin Porcelain Co., Sun Prairie, Wis.

Cut Insulation Parts

(V) AEROLITE ELECTRONIC HARDWARE CORP., 507 26th St., Union City, N. J. ADV. PG. 138.
(V) AMERICAN PHENOLIC CORPORATION, 1830 S. 54th Ave., Chicago 50, Ill. ADV. PG. 191.
Beach Precision Parts Co., Boonton, N. J.
Brandywine Fibre Co., 15th & Poplar Sts., Wilmington, Del.
(V) CAMBRIDGE THERMIONIC CORP., 445 Concord Ave., Cambridge, Mass. ADV. PG. 72.
(V) Crane Packing Co., 1800 Cuyler Ave., Chicago 13, Ill.
(V) Crowley Co., Inc., Henry L., 1 Central Ave., West Orange, N. J.
Electronic Mechanics, Inc., 70 Clifton Blvd., Clifton, N. J.

▽ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

▽Felt Products Mfg. Co., 1504 W. Carroll Ave., Chicago 7, Ill.
▽Franklin Mfg. Corp., A. W., 43-20 34th St., L. I. City, N. Y.
▽GENERAL ELECTRIC CO., Chemical Dept., Pittsfield, Mass. ADV. PG. 5 to 18.
▽Insulating Fabricators of New England, Inc., 69 Grove St., Watertown 72, Mass.
Insulating Fabricators, Inc., 150 Union Ave., East Rutherford, N. J.
▽Insulation Manufacturers Corp., 565 W. Washington Blvd., Chicago 6, Ill.
Mica Fabricating Co., 53 Central Ave., Rochelle Park, N. J.
▽MICA INSULATOR CO., Schenectady 1, N. Y. ADV. PG. 232.
▽Moore Co., Howard J., 108 Park Row, New York 7, N. Y.
▽Mykroy, Inc., Arlington Heights Airport, Arlington Heights, Ill.
▽National Electric Coil Co., Columbus 16, Ohio.
▽National Gasket & Mfg. Co., 124 E. 25th St., New York 10, N. Y.
▽NATIONAL VARNISHED PRODUCTS CORP., THE, 211 Randolph Ave., Woodbridge, N. J. ADV. PG. 248.
▽Nichols Products Co., Moorestown, N. J.
Penn Fibre & Specialty Co., 2020 E. Westmoreland St., Philadelphia 34, Pa.
▽Plastikraft Products Co., 16 Hudson St., New York 13, N. Y.
Printloid Inc., 95 Mercer St., New York, N. Y.
▽RICHARDSON CO., THE, 2767 Lake St., Melrose Park, Ill. ADV. PG. 144.
▽Rogers Corp., Manchester, Conn.
▽Taylor Fibre Co., Norristown, Pa.
▽VARFLEX CORP., 308 N. Jay St., Rome, N. Y. ADV. PG. 259.

Extruded Insulation Parts

▽AMERICAN LAVA CORP., Chattanooga 5, Tenn. ADV. PG. 37.
▽AMERICAN PHENOLIC CORPORATION, 1830 S. 54th Ave., Chicago 50, Ill. ADV. PG. 191.
▽Anchor Plastics Co., Inc., 533-541 Canal St., New York 13, N. Y.
▽CENTRALAB DIV. OF GLOBE UNION INC., 900 E. Keefe Ave., Milwaukee 1, Wis. ADV. PG. 64, 65.
▽Connecticut Hard Rubber Co., 407 East St., New Haven 9, Conn.
▽Dowley & Co., Inc., Henry L., 1 Central Ave., West Orange, N. J.
▽FEDERAL SCREW PRODUCTS, INC., 224 W. Huron St., Chicago 10, Ill. ADV. PG. 271.
▽GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PAGE 273.
▽GENERAL CERAMICS & STEATITE CORP., Keasbey, N. J. ADV. PG. 219.
▽GENERAL ELECTRIC CO., Chemical Dept., Pittsfield, Mass. ADV. PG. 5 to 18.
Insulating Fabricators, Inc., 150 Union Ave., East Rutherford, N. J.
▽INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
▽Isolantite Mfg. Corp., Stirling, N. J.
▽Kuchberger & Co., Inc., M., 1425 37th St., Brooklyn 18, N. Y.
Luzerne Rubber Co., Muirhead Ave., Trenton, N. J.
Mica Fabricating Co., 53 Central Ave., Rochelle Park, N. J.
▽Mykroy, Inc., Arlington Heights Airport, Arlington Heights, Ill.
▽NATIONAL VARNISHED PRODUCTS CORP., THE, 211 Randolph Ave., Woodbridge, N. J. ADV. PG. 248.
▽Nichols Products Co., Moorestown, N. J.
▽Smith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.
▽Star Porcelain Co., 61 Muirhead Ave., Trenton 9, N. J.
▽Steward Mfg. Co., O. M., Chattanooga, Tenn.
▽STUPAKOFF CERAMIC & MFG. CO., Latrobe, Pa. ADV. PG. 147.
▽SURPRENANT MFG. CO., 199 Washington St., Boston 10, Mass. ADV. PG. 229.
▽Thor Ceramics Inc., 225 Belleville Ave., Bloomfield, N. J.
▽VARFLEX CORP., 308 N. Jay St., Rome, N. Y. ADV. PG. 259.
▽Wisconsin Porcelain Co., Sun Prairie, Wis.

Fabricated Insulation Parts

▽AEROLITE ELECTRONIC HARDWARE CORP., 507 26th St., Union City, N. J. ADV. PG. 138.
American Communications Corp., 306 Broadway, New York 7, N. Y.
▽AMERICAN LAVA CORP., Chattanooga 5, Tenn. ADV. PG. 37.
▽AMERICAN PHENOLIC CORPORATION, 1830 S. 54th Ave., Chicago 50, Ill. ADV. PG. 191.
▽Austin Co., Inc., O., 335 Throop Ave., Brooklyn 21, N. Y.
▽Baer Co., N. S., 9 Montgomery St., Hillside, N. J.
Beach Precision Parts Co., Boonton, N. J.
Brandywine Fibre Co., 15th & Poplar Sts., Wilmington, Del.
▽CAMBRIDGE THERMIONIC CORP., 445 Concord Ave., Cambridge, Mass. ADV. PG. 72.
▽CENTRALAB DIV. OF GLOBE UNION INC., 900 E. Keefe Ave., Milwaukee, Wis. ADV. PG. 64, 65.
▽CINCH MFG. CORP., 1026 S. Homan Ave., Chicago 24, Ill. ADV. PG. 154.
▽Citation Products Co., 233 E. 146th St., New York 51, N. Y.
▽Crane Packing Co., 1800 Cuyler Ave., Chicago 13, Ill.
Electronic Mechanics Inc., 70 Clifton Blvd., Clifton, N. J.
Felsenthal & Sons, Inc., G., 4100 W. Grand St., Chicago 51, Ill.
▽Felt Products Mfg. Co., 1504 W. Carroll Ave., Chicago 7, Ill.
▽Franklin Fibre-Lamitex Corp., 12th and French Sts., Wilmington, Del.
▽Franklin Mfg. Corp., A. W., 43-20 34th St., Long Island City, N. Y.
▽GENERAL ELECTRIC CO., Chemical Dept., Pittsfield, Mass. ADV. PG. 5 to 18.
▽General R-F Fittings Co., 126 Dartmouth St., Boston 16, Mass.
▽Hallett Mfg. Co., 1601 Florence Ave., Inglewood, Calif.
▽Huse Liberty Mica Co., 171 Camden St., Boston, Mass.
Insulating Fabricators, Inc., 150 Union Ave., East Rutherford, N. J.
▽Insulating Fabricators of New England, Inc., 69 Grove St., Watertown 72, Mass.
▽Insulation Manufacturers Corp., 565 W. Washington Blvd., Chicago 6, Ill.
▽INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
▽Isolantite Mfg. Corp., Stirling, N. J.
▽Keystone Electronics Co., 50-52 Franklin St., New York 13, N. Y.
LaMagna Mfg. Co., Inc., East Rutherford, N. J.
▽Lamicoid Fabricators, Inc., 4545 W. Cortland St., Chicago 39, Ill.
Luzerne Rubber Co., Muirhead Ave., Trenton, N. J.
▽Macallen Co., The, 16 Macallen St., Boston 27, Mass.
Mica Fabricating Co., 53 Central Ave., Rochelle Park, N. J.
▽MICA INSULATOR CO., Schenectady 1, N. Y. ADV. PG. 232.
Micarta Fabricators, Inc., 5324 Ravenswood Ave., Chicago 40, Ill.
▽Molded Insulation Co., Aircraft Control Div., 335 E. Price, Philadelphia, Pa.
▽Moore Co., Howard J., 108 Park Row, New York 7, N. Y.
▽MYCALEX CORP. OF AMERICA, 60 Clifton Blvd., Clifton, N. J. ADV. PG. 163.
▽Mykroy, Inc., Arlington Heights, Airport, Arlington Heights, Ill.
▽National Gasket & Washer Mfg. Co., 124 E. 25th St., New York 10, N. Y.
▽NATIONAL VARNISHED PRODUCTS CORP., THE, 211 Randolph Ave., Woodbridge, N. J. ADV. PG. 248.
▽NATIONAL VULCANIZED FIBRE CO., Wilmington, Del. ADV. PG. 183.
▽Nichols Products Co., Moorestown, N. J.
▽Paneyte Div., St. Regis Paper Co., 230 Park Ave., New York, N. Y.
Penn Fibre & Specialty Co., 2020 E. Westmoreland St., Philadelphia 34, Pa.
Plastic Accessories, Inc., 93 Mercer St., New York 12, N. Y.
▽Plastikraft Products Co., 20 Hudson St., New York 13, N. Y.
Printloid Inc., 95 Mercer St., New York, N. Y.
▽RICHARDSON CO., THE, 2767 Lake St., Melrose Park, Ill. ADV. PG. 144.
▽Rogers Corp., Manchester, Conn.
▽Smith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.
▽Stevens Products Inc., 86-88 Main St., East Orange, N. J.
▽Synthane Corp., Oaks, Pa.
▽Taylor Fibre Co., Norristown, Pa.
▽Thor Ceramics Inc., 225 Belleville Ave., Bloomfield, N. J.
▽Wilmington Fibre Specialty Co., P. O. Drawer 1028, Wilmington 99, Del.

Insulating Cord

▽AMERICAN PHENOLIC CORPORATION, 1830 S. 54th Ave., Chicago 50, Ill. ADV. PG. 191.
▽GENERAL ELECTRIC CO., Chemical Dept., Pittsfield, Mass. ADV. PG. 5 to 18.
▽HEMINWAY & BARTLETT MFG. Co., 432 Fourth Ave., New York 16, N. Y. ADV. PG. 276.

Insulating Foil

▽Irvington Varnish & Insulator Co., 10 Argyle Terrace, Irvington 11, N. J.

Insulating Sleeves

▽Aircraft-Marine Products, Inc., 1523 N. Fourth St., Harrisburg, Pa.
▽AMERICAN MOLDED PRODUCTS CORP., 1644 N. Honore St., Chicago 22, Ill. ADV. PG. 263.
▽Anchor Plastics Co., Inc., 533-541 Canal St., New York 13, N. Y.
Beach Precision Parts Co., Boonton, N. J.
▽BENTLEY HARRIS MFG. CO., Conshohocken, Pa. ADV. PG. 112.
▽BRAND CO., WM., Willimantic, Conn. ADV. PG. 120, 121.
Brandywine Fibre Co., 15th & Poplar Sts., Wilmington, Del.
▽Bundy Engineering Co., Inc., 107 Bruckner Blvd., New York 54, N. Y.
▽CENTRALAB DIV. OF GLOBE UNION INC., 900 E. Keefe Ave., Milwaukee, Wis. ADV. PG. 64, 65.
▽CLEVELAND CONTAINER CO., THE, 6201 Barberton Ave., Cleveland 2, Ohio. ADV. PG. 153.
▽Connecticut Hard Rubber Co., 407 East St., New Haven 9, Conn.
▽Crane Packing Co., 1800 Cuyler Ave., Chicago 13, Ill.
▽GENERAL CERAMICS & STEATITE CORP., Keasbey, N. J. ADV. PG. 219.
▽GENERAL ELECTRIC CO., Chemical Dept., Pittsfield, Mass. ADV. PG. 5 to 18.
▽Hallett Mfg. Co., 1601 Florence Ave., Inglewood, Calif.
Insulating Fabricators, Inc., 150 Union Ave., East Rutherford, N. J.
▽Insulation Manufacturers Corp., 565 W. Washington Blvd., Chicago 6, Ill.
▽Irvington Varnish & Insulator Co., 10 Argyle Terrace, Irvington 11, N. J.
▽Laconia Corp., 37 S. 6th St., Newark 7, N. J.
Luzerne Rubber Co., Muirhead Ave., Trenton, N. J.
Mica Fabricating Co., 53 Central Ave., Rochelle Park, N. J.
▽Minnesota Mining & Mfg. Co., 900 Fauquier Ave., St. Paul, Minn.
▽MITCHELL-RAND INSULATION CO., INC., 51 Murray St., New York 7, N. Y. ADV. PG. 92.
▽NATIONAL VARNISHED PRODUCTS CORP., THE, 211 Randolph Ave., Woodbridge, N. J. ADV. PG. 248.
▽NATIONAL VULCANIZED FIBRE CO., Wilmington, Del. ADV. PG. 183.
Printloid Inc., 95 Mercer St., New York, N. Y.
▽RICHARDSON CO., THE, 2767 Lake St., Melrose Park, Ill. ADV. PG. 144.
▽Schott Co., Walter L., 9306 Santa Monica Blvd., Beverly Hills, Calif.
▽Smith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.
▽Taylor Fibre Co., Norristown, Pa.
▽Thor Ceramics Inc., 225 Belleville Ave., Bloomfield, N. J.
▽VARFLEX CORP., 308 N. Jay St., Rome, N. Y. ADV. PG. 259.
▽Wilmington Fibre Specialty Co., P. O. Drawer 1028, Wilmington 99, Del.

Laminated Insulation Parts

▽Baer Co., N. S., 9 Montgomery St., Hillside, N. J.
Brandywine Fibre Co., 15th & Poplar Sts., Wilmington, Del.
Buggie & Co., H. H., 726 Stanton St., Toledo, Ohio.
▽CAMBRIDGE THERMIONIC CORP., 445 Concord Ave., Cambridge, Mass. ADV. PG. 72.
▽CINCH MFG. CORP., 1026 S. Homan Ave., Chicago 24, Ill. ADV. PG. 154.
▽CLEVELAND CONTAINER CO., THE, 6201 Barberton Ave., Cleveland 2, Ohio. ADV. PG. 153.
▽Continental Diamond Fibre Co., 16 Chapel St., Newark 16, Del.
Eby, Inc., Hugh H., 4700 Stenton Ave., Philadelphia 44, Pa.
▽Formica Co., The, 4640 Spring Grove Ave., Cincinnati 32, Ohio.
▽Franklin Fibre-Lamitex Corp., 12th and French Sts., Wilmington, Del.
▽Franklin Mfg. Corp., A. W., 43-20 34th St., Long Island City, N. Y.
▽GENERAL ELECTRIC CO., Chemical Dept., Pittsfield, Mass. ADV. PG. 5 to 18.
▽Huse Liberty Mica Co., 171 Camden St., Boston, Mass.
Insulating Fabricators, Inc., 150 Union Ave., East Rutherford, N. J.
▽Insulating Fabricators of New England, Inc., 69 Grove St., Watertown 72, Mass.
▽Insulation Manufacturers Corp., 565 W. Washington Blvd., Chicago 6, Ill.
▽Irvington Varnish & Insulator Co., 10 Argyle Terrace, Irvington 11, N. J.
▽Lamicoid Fabricators, Inc., 4545 W. Cortland St., Chicago 39, Ill.
Mica Fabricating Co., 53 Central Ave., Rochelle Park, N. J.
▽MICA INSULATOR CO., Schenectady 1, N. Y. ADV. PG. 232.
Micarta Fabricators, Inc., 5324 Ravenswood Ave., Chicago 40, Ill.
▽Molded Insulation Co., Aircraft Control Div., 335 E. Price St., Philadelphia, Pa.
▽Moore Co., Howard J., 108 Park Row, New York 7, N. Y.
▽National Electric Coil Co., Columbus 16, Ohio.
▽National Gasket & Washer Mfg. Co., Inc., 124 E. 25th St., New York 10, N. Y.
▽NATIONAL VULCANIZED FIBRE CO., Wilmington, Del. ADV. PG. 183.
▽Paneyte Div., St. Regis Paper Co., 230 Park Ave., New York 17, N. Y.
Penn Fibre & Specialty Co., 2020 E. Westmoreland St., Philadelphia 34, Pa.

(V) indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

(V)Plastacraft Products Co., 20 Hudson St., New York 13, N. Y.
(V)RICHARDSON CO., THE, 2767 Lake St., Melrose Park, Ill. ADV. PG. 144.
(V)Rogers Corp., Manchester, Conn.
Spaulding Fibre Co., Inc., 310 Wheeler St., Tonawanda, N. Y.
(V)Synthane Corp., Oaks, Pa.
(V)Taylor Fibre Co., Norristown, Pa.
(V)WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
(V)Wilmington Fibre Specialty Co., P. O. Drawer 1028, Wilmington 99, Del.

Molded Insulation Parts

(V)ALDEN PRODUCTS CO., 117 No. Main St., Brockton 64, Mass. ADV. PG. 255.
American Insulator Corp., New Freedom, Pa.
(V)AMERICAN LAVA CORP., Chattanooga 5, Tenn. ADV. PG. 27.
(V)AMERICAN PHENOLIC CORPORATION, 1830 S. 54th Ave., Chicago 50, Ill. ADV. PG. 191.
(V)BIWAX CORP., 3445 Howard St., Skokie, Ill. ADV. PG. 242.
Bountiful Molding Co., Bountiful, N. J.
Buggie & Co., H. H., 726 Stanton St., Toledo, Ohio.
(V)CENTRALAB DIV. OF GLOBE UNION INC., 900 E. Keefe Ave., Milwaukee, Wis. ADV. PG. 64, 65.
(V)CINCH MFG. CORP., 1026 S. Homan Ave., Chicago 24, Ill. ADV. PG. 154.
(V)Connecticut Hard Rubber Co., 407 East St., New Haven 9, Conn.
(V)Consolidated Molded Products Corp., Scranton 2, Pa.
(V)Continental Diamond Fibre Co., 16 Chapel St., Newark 16, Del.
(V)Crane Packing Co., 1800 Cuyler Ave., Chicago 13, Ill.
Day, Inc., Hugh H., 4700 Stenton Ave., Philadelphia 44, Pa.
Electronic Mechanics Inc., 70 Clifton Blvd., Clifton, N. J.
Feisenthal & Sons, Inc., G., 4100 W. Grand Ave., Chicago 51, Ill.
(V)Felt Products Mfg. Co., 1504 W. Carroll Ave., Chicago 7, Ill.
(V)Franklin Fibre-Lamitex Corp., 12th and French Sts., Wilmington, Del.
(V)Franklin Mfg. Corp., A. W., 43-20 34th St., Long Island City, N. Y.
(V)GENERAL ELECTRIC CO., Chemical Dept., Pittsfield, Mass. ADV. PG. 5 to 18.
Gits Molding Corp., 4600 W. Huron St., Chicago 44, Ill.
Grieb Reproducer Corp., 100 Willow Ave., New York 54, N. Y.
(V)Hallett Mfg. Co., 1601 Florence Ave., Inglewood, Calif.
(V)Heldor Bushing & Terminal Co., Inc., P. O. Box 91, Orange, N. J.
Insulation Mfg. Co., 11 New York Ave., Brooklyn, N. Y.
(V)Keasbey & Mattison, Ambler, Pa.
Laminated Plastics, Inc., 14838 Euclid Ave., Cleveland 12, Ohio.
Lovejoy Rubber Co., Muirhead Ave., Trenton, N. J.
(V)Marsden Co., The, 16 Macallen St., Boston 27, Mass.
Mack Molding Co., Wayne, N. J.
(V)Mayfair Molded Products Corp., 4440 N. Elston Ave., Chicago 30, Ill.
Mica Fabricating Co., 53 Central Ave., Rochelle Park, N. J.
(V)Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.
(V)Molded Insulation Co., Aircraft Control Div., 335 E. Price St., Philadelphia, Pa.
(V)MYCALEX CORP. OF AMERICA, 60 Clifton Blvd., Clifton, N. J. ADV. PG. 163.
(V)Myanite, Inc., Arlington Heights Airport, Arlington Heights, Ill.
(V)Northern Industrial Chemical Co., 111 Eliot St., South Boston 27, Mass.
(V)Remler Co., Ltd., 2101 Bryant St., San Francisco 10, Calif.
(V)RICHARDSON CO., THE, 2767 Lake St., Melrose Park, Ill. ADV. PG. 144.
(V)ROGAN BROS., 2500 W. Irving Pk., Chicago 18, Ill. ADV. PG. 226.
(V)Scintilla Magneto Div. of Bendix Aviation Corp., Sidney, N. Y.
(V)Smith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.
Smith Mfg. Co., Nathan R., 105 Pasadena Ave., So. Pasadena, Calif.
(V)Star Porcelain Co., 61 Muirhead Ave., Trenton 9, N. J.
(V)Taylor Fibre Co., Norristown, Pa.
(V)Waterbury Companies, Inc., Waterbury 90, Conn.
(V)WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
(V)Wisconsin Porcelain Co., Sun Prairie, Wis.

Plastic Insulation Parts

(V)ALDEN PRODUCTS CO., 117 No. Main St., Brockton 64, Mass. ADV. PG. 255.
American Insulator Corp., New Freedom, Pa.
(V)AMERICAN PHENOLIC CORPORATION, 1830 S. 54th Ave., Chicago 50, Ill. ADV. PG. 191.
(V)Anchor Plastics Co., Inc., 533-541 Canal St., New York 13, N. Y.
(V)Baer Co., N. S., 9 Montgomery St., Hillside, N. J.
Beach Precision Parts Co., Boonton, N. J.
Boonton Molding Co., Boonton, N. J.
Brandywine Fibre Co., 15th & Poplar Sts., Wilmington, Del.
Buggie & Co., H. H., 726 Stanton St., Toledo, Ohio.
(V)CINCH MFG. CORP., 1026 S. Homan Ave., Chicago 24, Ill. ADV. PG. 154.
(V)Consolidated Molded Prods. Corp., Scranton 2, Pa.
(V)Continental Diamond Fibre Co., 16 Chapel St., Newark 16, Delaware.
(V)Crane Packing Co., 1800 Cuyler Ave., Chicago 13, Ill.
(V)Dielectric Materials Co., 5315-17 N. Ravenswood Ave., Chicago 40, Ill.
Feisenthal & Sons, Inc., G., 4100 W. Grand Ave., Chicago 51, Ill.
(V)Formica Co., The, 4640 Spring Grove Ave., Cincinnati 32, Ohio.
(V)Franklin Mfg. Corp., A. W., 43-20 34th St., Long Island City, N. Y.
Gemloid Corp., 39-10 Albion Ave., Elmhurst, N. Y.
(V)GENERAL ELECTRIC CO., Chemical Dept., Pittsfield, Mass. ADV. PG. 5 to 18.
Gits Molding Corp., 4600 W. Huron St., Chicago 44, Ill.
Greenfort Insulation Co., 31 W. 21st St., New York 10, N. Y.
Grieb Reproducer Corp., 100 Willow Ave., New York 54, N. Y.
(V)Haberland Mfg. Co., P. O. Box 476, Passaic, N. J.
(V)Hallett Mfg. Co., 1601 Florence Ave., Inglewood, Calif.
(V)Industrial Precision Products Co., 315-325 N. Hoyne Ave., Chicago 12, Ill.
(V)Insulating Fabricators of New England, Inc., 69 Grove St., Watertown 72, Mass.
Insulating Fabricators, Inc., 150 Union Ave., East Rutherford, N. J.
(V)Irvington Varnish & Insulator Co., 10 Argyle Terrace, Irvington 11, N. J.
(V)Keystone Electronics Co., 50-52 Franklin St., New York 13, N. Y.
La Magna Mfg. Co., Inc., East Rutherford, N. J.
(V)Laminoid Fabricators, Inc., 4545 W. Cortland St., Chicago 39, Ill.
Mack Molding Co., Wayne, N. J.
Mica Fabricating Co., 53 Central Ave., Rochelle Park, N. J.
(V)Minicraft Products Inc., 701 McCarter Highway, Newark 5, N. J.
Micarta Fabricators, Inc., 5324 Ravenswood Ave., Chicago 40, Ill.
(V)Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.
(V)Molded Insulation Co., Aircraft Control Div., 335 E. Price St., Philadelphia, Pa.
(V)MYCALEX CORP. OF AMERICA, 60 Clifton Blvd., Clifton, N. J. ADV. PG. 163.
(V)NATIONAL VARNISHED PRODUCTS CORP., THE, 211 Randolph Ave., Woodbridge, N. J. ADV. PG. 248.
(V)NATIONAL VULCANIZED FIBRE CO., Wilmington, Del. ADV. PG. 183.
(V)Nichols Products Co., Moorestown, N. J.
(V)Pioneyte Div., St. Regis Paper Co., 230 Park Ave., New York 17, N. Y.
(V)Plaxtex Specialty Co., Philadelphia 40, Pa.
Resin Fibre & Specialty Co., 2020 E. Westmoreland St., Philadelphia 34, Pa.
Plastic Accessories, Inc., 93 Mercer St., New York 12, N. Y.
(V)Plastacraft Products Co., 20 Hudson St., New York 13, N. Y.
(V)Plastomold Corp., Attleboro, Mass.
(V)Plax Corp., P. O. Box 1019, Hartford, Conn.
Printloid Inc., 95 Mercer St., New York, N. Y.
(V)Remler Co., Ltd., 2101 Bryant St., San Francisco 10, Calif.
(V)RICHARDSON CO., THE, 2767 Lake St., Melrose Park, Ill. ADV. PG. 144.
(V)ROGAN BROS., 2500 W. Irving Pk., Chicago 18, Ill. ADV. PG. 226.
(V)Scintilla Magneto Div. of Bendix Aviation Corp., Sidney, N. Y.
(V)Stillcocks Molder Co., 10 Parker Ave. W., So. Orange, N. J.
(V)Smith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.
Spaulding Fibre Co., Inc., 310 Wheeler St., Tonawanda, N. Y.
(V)Synthane Corp., Oaks, Pa.
(V)Taylor Fibre Co., Norristown, Pa.
(V)VARFLEX CORP., 308 N. Jay St., Rome, N. Y. ADV. PG. 259.
(V)Waterbury Companies, Inc., Waterbury, 90, Conn.
(V)WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

Rods

(V)AEROLITE ELECTRONIC HARDWARE CORP., 507 26th St., Union City, N. J. ADV. PG. 238.
(V)Anchor Plastics Co., Inc., 533-541 Canal St., New York 13, N. Y.
(V)Baer Co., N. S., 9 Montgomery St., Hillside, N. J.
Beach Precision Parts Co., Boonton, N. J.
Brandywine Fibre Co., 15th & Poplar Sts., Wilmington, Del.
(V)Chase Brass & Copper Co., Inc., Waterbury 91, Conn.
(V)Continental Diamond Fibre Co., 16 Chapel St., Newark 16, Del.
(V)Crane Packing Co., 1800 Cuyler Ave., Chicago 13, Ill.
(V)Formica Co., The, 4640 Spring Grove Ave., Cincinnati 32, Ohio.
(V)Franklin Fibre-Lamitex Corp., 12th & French Sts., Wilmington, Del.
(V)GENERAL ELECTRIC CO., Chemical Dept., Pittsfield, Mass. ADV. PG. 5 to 18.
(V)Insulating Fabricators of New England, Inc., 69 Grove St., Watertown 72, Mass.
Insulating Fabricators, Inc., 150 Union Ave., East Rutherford, N. J.
(V)Kirchberger & Co., Inc., M., 1425 37th St., Brooklyn, N. Y.
(V)Laminoid Fabricators Inc., 4545 W. Cortland St., Chicago 39, Ill.
Lucerne Rubber Co., Muirhead Ave., Trenton, N. J.
Mica Fabricating Co., 53 Central Ave., Rochelle Park, N. J.
(V)MICA INSULATOR CO., Schenectady 1, N. Y. ADV. PG. 232.
(V)Myanite, Inc., Arlington Heights Airport, Arlington Heights, Ill.
National Gasket & Washer Mfg. Co., Inc., 124 E. 25th St., New York 10, N. Y.
(V)NATIONAL VULCANIZED FIBRE CO., Wilmington, Del. ADV. PG. 183.
Penn Fibre & Specialty Co., 2020 E. Westmoreland St., Philadelphia 34, Pa.
Plastic Accessories, Inc., 93 Mercer St., New York 12, N. Y.
(V)Plastacraft Products Co., 20 Hudson St., New York 13, N. Y.
Printloid Inc., 95 Mercer St., New York, N. Y.
(V)RICHARDSON CO., THE, 2767 Lake St., Melrose Park, Ill. ADV. PG. 144.
(V)Lovell Mfg. Co., Industrial Fastener Div., Waterbury, Conn.
(V)Smith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.
Spaulding Fibre Co., Inc., 310 Wheeler St., Tonawanda, N. Y.
(V)Synthane Corp., Oaks, Pa.
(V)Taylor Fibre Co., Norristown, Pa.
(V)WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

Screw Machine Parts

(V)AEROLITE ELECTRONIC HARDWARE CORP., 507 26th St., Union City, N. J. ADV. PG. 238.
(V)Allmetal Screw Products Co., Inc., 33 Greene St., New York 13, N. Y.
(V)ART-CLOYD METAL PRODUCTS CORP., 2913 Cropsey Ave., Brooklyn 14, N. Y. ADV. PG. 272.
(V)BLAKE & JOHNSON CO., Waterville 48, Conn. ADV. PG. 223.
Brandywine Fibre Co., 15th & Poplar Sts., Wilmington, Del.
(V)CAMBRIDGE THERMIONIC CORP., 445 Concord Ave., Cambridge, Mass. ADV. PG. 72.
(V)Chase Brass & Copper Co., Inc., Waterbury 91, Conn.
(V)Continental Diamond Fibre Co., 16 Chapel St., Newark 16, Del.
(V)Corbin Screw Div., American Hardware Corp., High, Myrtle & Grove Sts., New Britain, Conn.
(V)Kyntex Specialty Co., Philadelphia 40, Pa.
(V)FEDERAL SCREW PRODUCTS INC., 224 W. Huron St., Chicago 10, Ill. ADV. PG. 271.
(V)Franklin Fibre-Lamitex Corp., 12th and French Sts., Wilmington, Del.
(V)Hallett Mfg. Co., 1601 Florence Ave., Inglewood, Calif.
(V)Heldor Bushing & Terminal Co., Inc., P. O. Box 91, Orange, N. J.
(V)Hi-Cal Corp., 47-23 35th St., Long Island City 1, N. Y.
(V)Industrial Precision Products Co., 315-325 N. Hoyne Ave., Chicago 12, Ill.
(V)INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
Insulating Fabricators, Inc., 150 Union Ave., East Rutherford, N. J.
(V)Insulating Fabricators of New England, Inc., 69 Grove St., Watertown 72, Mass.
(V)Judd Co., H. L., 87 Chambers St., New York 7, N. Y.
(V)Keystone Electronics Co., 50-52 Franklin St., New York 13, N. Y.
(V)Klinge Electronics Co., Inc., 811 Lexington Ave., Brooklyn 21, N. Y.
La Magna Mfg. Co., Inc., East Rutherford, N. J.
(V)Laminoid Fabricators, Inc., 4545 W. Cortland St., Chicago 39, Ill.
Lucerne Rubber Co., Muirhead Ave., Trenton, N. J.
(V)Molded Insulation Co., Aircraft Control Div., 335 E. Price St., Philadelphia, Pa.
(V)NATIONAL VULCANIZED FIBRE CO., Wilmington, Del. ADV. PG. 183.
Penn Fibre & Specialty Co., 2020 E. Westmoreland St., Philadelphia 34, Pa.
Plastic Accessories, Inc., 93 Mercer St., New York 12, N. Y.
(V)PRECISION METAL PRODUCTS CO., of Malden, 342 Eastern Ave., Malden 48, Mass. ADV. PG. 270.
Printloid Inc., 95 Mercer St., New York, N. Y.
(V)Remler Co., Ltd., 2101 Bryant St., San Francisco 10, Calif.
(V)Lovell Mfg. Co., Industrial Fastener Div., Waterbury, Conn.
(V)Smith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.
Smith Mfg. Co., Nathan R., 105 Pasadena Ave., S. Pasadena, Calif.

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

Spaulding Fibre Co., Inc., 310 Wheeler St., Tonawanda, N. Y.
Ⓥ Stimpson Co., Inc., Edwin B., 74 Franklin Ave., Brooklyn 5, N. Y.
Ⓥ Synthane Corp., Oaks, Pa.
Ⓥ Taylor Fibre Co., Norristown, Pa.
Ⓥ U. S. Engineering Co., 531 Commercial St., Glendale 3, Calif.
Ⓥ Vallorbs Jewel Co., Lancaster, Pa.

Sheets

Ⓥ AEROLITE ELECTRONIC HARDWARE CORP., 507 26th St., Union City, N. J. ADV. PG. 138.
Ⓥ ATLANTIC INDIA RUBBER WORKS, INC., 571 W. Polk St., Chicago 7, Ill. ADV. PG. 271.
Ⓥ Baer Co., N. S., 9 Montgomery St., Hillside, N. J.
Ⓥ Chase Brass & Copper Co., Inc., Waterbury 91, Conn.
Ⓥ Crane Packing Co., 1800 Cuyler Ave., Chicago 13, Ill.
Ⓥ Felt Products Mfg. Co., 1504 W. Carroll Ave., Chicago 7, Ill.
Ⓥ Formica Co., The, 4640 Spring Grove Ave., Cincinnati 32, Ohio.
Ⓥ Franklin Fibre-Lamitex Corp., 12th and French Sts., Wilmington, Del.
Ⓥ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
Ⓥ GENERAL ELECTRIC CO., Chemical Dept., Pittsfield, Mass. ADV. PG. 5 to 18.
Insulating Fabricators, Inc., 150 Union Ave., East Rutherford, N. J.
Ⓥ Johns-Manville, 22 E. 40th St., New York 16, N. Y.
Ⓥ Lamicoid Fabricators, Inc., 4545 W. Cortland St., Chicago 39, Ill.
Luzerne Rubber Co., Mulstead Ave., Trenton, N. J.
Mica Fabricating Co., 53 Central Ave., Rochelle Park, N. J.
Ⓥ MICA INSULATOR CO., Schenectady 1, N. Y. ADV. PG. 232.
Ⓥ Mykroy, Inc., Arlington Heights Airport, Arlington Heights, Ill.
Ⓥ NATIONAL VARNISHED PRODUCTS CORP., THE, 211 Randolph Ave., Woodbridge, N. J. ADV. PG. 248.
Ⓥ NATIONAL VULCANIZED FIBRE CO., Wilmington, Del. ADV. PG. 183.
Penn Fibre & Specialty Co., 2020 E. Westmoreland St., Philadelphia 34, Pa.
Plastic Accessories, Inc., 93 Mercer St., New York 12, N. Y.
Ⓥ Plastocraft Products Co., 20 Hudson St., New York 13, N. Y.
Richford, Inc., 99 Mercer St., New York, N. Y.
Ⓥ RICHARDSON CO., THE, 2767 Lake St., Melrose Park, Ill. ADV. PG. 144.
Ⓥ Rogers Corp., Manchester, Conn.
Ⓥ Synthane Corp., Oaks, Pa.
Ⓥ Taylor Fibre Co., Norristown, Pa.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

Stampings & Punchings—Ceramic

Ⓥ AMERICAN LAVA CORP., Chattanooga 5, Tenn. ADV. PG. 27.
Ⓥ ART-LLOYD METAL PRODS. CORP., 2973 Crosley Ave., Brooklyn 14, N. Y. ADV. PG. 272.
Ⓥ CENTRALAB, DIV. OF GLOBE UNION INC., 900 E. Keefe Ave., Milwaukee 1, Wis. ADV. PG. 64, 65.
Ⓥ Donnelly Electric & Mfg. Co., 3050 Washington St., Roxbury, Mass.
Ⓥ GENERAL CERAMICS & STEATITE CORP., Keasbey, N. J. ADV. PG. 219.
Ⓥ Hallett Mfg. Co., 1601 Florence Ave., Inglewood, Calif.
Ⓥ Hinkleheimer & Co., Inc., M., 1425 37th St., Brooklyn 18, N. Y.
Ⓥ Laconia Corp., 375 S. 6th St., Newark 7, N. J.
Louthan Mfg. Co., East Liverpool, Ohio.
Mica Fabricating Co., 53 Central Ave., Rochelle Park, N. J.
Penn Fibre & Specialty Co., 2020 E. Westmoreland St., Philadelphia 34, Pa.
Ⓥ Reports Co., Paul P., 641 E. 61st St., Los Angeles 1, Calif.
Ⓥ Smith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.
Ⓥ Steward Mfg. Co., D. M., Chattanooga, Tenn.
Ⓥ Thor Ceramics Inc., 225 Belleville Ave., Bloomfield, N. J.
Ⓥ Whitehead Stamping Co., 1691 W. Lafayette Blvd., Detroit 16, Mich.
Williams, Hampden, Mass.
Ⓥ Wisconsin Porcelain Co., Sun Prairie, Wisconsin.

Stampings & Punchings—Fibre

Ⓥ AEROLITE ELECTRONIC HARDWARE CORP., 507 26th St., Union City, N. J. ADV. PG. 138.
Ⓥ ART-LLOYD METAL PRODUCTS CORP., 2973 Crosley Ave., Brooklyn 14, N. Y. ADV. PG. 272.
Atlas Fibre Co., Inc., C., 115 Throop Ave., Brooklyn 21, N. Y.
Baer Co., N. S., 9 Montgomery St., Hillside, N. J.
Brandywine Fibre Co., 15th & Poplar Sts., Wilmington, Del.
Ⓥ CINCH MFG. CORP., 1026 S. Homan Ave., Chicago 24, Ill. ADV. PG. 154.
Ⓥ Citation Products Co., 233 E. 146th St., New York 51, N. Y.
Ⓥ Continental Diamond Fibre Co., 16 Chapel St., Newark 16, Del.
Eby, Inc., Hugh H., 4700 Stenton Ave., Philadelphia 44, Pa.
Ⓥ Felt Products Mfg. Co., 1504 W. Carroll Ave., Chicago 7, Ill.
Ⓥ Franklin Fibre-Lamitex Corp., 12th and French Sts., Wilmington, Del.
Ⓥ Franklin Mfg. Corp., A. W., 43-20 34th St., Long Island City, N. Y.
Ⓥ Hallett Mfg. Co., 1601 Florence Ave., Inglewood, Calif.
Ⓥ Industrial Precision Products Co., 315-325 N. Hoyne Ave., Chicago 12, Ill.
Ⓥ Insulating Fabricators of New England, Inc., 69 Grove St., Watertown 72, Mass.
Insulating Fabricators, Inc., 150 Union Ave., East Rutherford, N. J.
Ⓥ Insulation Manufacturers Corp., 565 W. Washington Blvd., Chicago 6, Ill.
Ⓥ INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
Ⓥ Keystone Electronics Co., 50-52 Franklin St., New York 13, N. Y.
La Magna Mfg. Co., Inc., East Rutherford, N. J.
Ⓥ Lamicoid Fabricators, Inc., 4545 W. Cortland St., Chicago 39, Ill.
Mica Fabricating Co., 52 Central Ave., Rochelle Park, N. J.
Micarta Fabricators, Inc., 5324 Ravenswood Ave., Chicago 40, Ill.
Ⓥ Molded Insulation Co., Aircraft Control Div., 335 E. Price St., Philadelphia, Pa.
Ⓥ Moore Co., Howard J., 108 Park Row, New York 7, N. Y.
Ⓥ National Gasket & Washer Mfg. Co., 124 E. 25th St., New York 10, N. Y.
Ⓥ NATIONAL VULCANIZED FIBRE CO., Wilmington, Del. ADV. PG. 183.
Penn Fibre & Specialty Co., 2020 E. Westmoreland St., Philadelphia 34, Pa.
Ⓥ Plastocraft Products Co., 20 Hudson St., New York 13, N. Y.
Ⓥ RICHARDSON CO., THE, 2767 Lake St., Melrose Park, Ill. ADV. PG. 144.
Ⓥ Rogers Corp., Manchester, Conn.
Ⓥ Smith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.
Spaulding Fibre Co., Inc., 310 Wheeler St., Tonawanda, N. Y.
Ⓥ Taylor Fibre Co., Norristown, Pa.
Ⓥ Whitehead Stamping Co., 1691 W. Lafayette Blvd., Detroit 16, Mich.
Williams, Hampden, Mass.
Ⓥ Wilmington Fibre Specialty Co., P. O. Drawer 1028, Wilmington 99, Del.

Stampings & Punchings—Paper—Mica

Aldine Paper Co., Inc., 535 5th Ave., New York 17, N. Y.
Austin Co., Inc., O., 335 Throop Ave., Brooklyn 21, N. Y.
Brandywine Fibre Co., 15th & Poplar Sts., Wilmington, Del.
Ⓥ Citation Products Co., 233 E. 146th St., New York 51, N. Y.
Ⓥ Felt Products Mfg. Co., 1504 W. Carroll Ave., Chicago 7, Ill.
Ford Radio & Mica Corp., 536 63rd St., Brooklyn, N. Y.
Ⓥ Franklin Mfg. Corp., A. W., 43-20 34th St., Long Island City, N. Y.
Ⓥ GENERAL ELECTRIC CO., Chemical Dept., Pittsfield, Mass. ADV. PG. 5 to 18.
Ⓥ Industrial Precision Products Co., 315-325 N. Hoyne Ave., Chicago 12, Ill.
Insulating Fabricators, Inc., 150 Union Ave., East Rutherford, N. J.
Ⓥ Insulation Manufacturers Corp., 565 W. Washington Blvd., Chicago 6, Ill.
Ⓥ Keystone Electronics Co., 50-52 Franklin St., New York 13, N. Y.
Ⓥ Lamicoid Fabricators, Inc., 4545 W. Cortland St., Chicago 39, Ill.
Ⓥ Macallen Co., The, 16 Macallen St., Boston 27, Mass.
Mica Fabricating Co., 53 Central Ave., Rochelle Park, N. J.
Ⓥ MICA INSULATOR CO., Schenectady 1, N. Y. ADV. PG. 232.
Ⓥ Molded Insulation Co., Aircraft Control Div., 335 E. Price St., Philadelphia, Pa.
Ⓥ Moore Co., Howard J., 108 Park Row, New York, N. Y.
Ⓥ National Electric Coil Co., Columbus 16, Ohio.
Penn Fibre & Specialty Co., 2020 E. Westmoreland St., Philadelphia 34, Pa.
Ⓥ Whitehead Stamping Co., 1691 W. Lafayette Blvd., Detroit 16, Mich.

Tapes, Insulating

Ⓥ Acme Wire Co., New Haven 4, Conn.
Aldine Paper Co., 535 5th Ave., New York 17, N. Y.
Ⓥ Haver & Reed, 222 W. Adams St., Chicago, Ill.
Ⓥ BISHOP MFG. CORP., 254 W. 31st St., New York 1, N. Y. ADV. PG. 255.
Ⓥ BRAND & CO., WM., Willimantic, Conn. ADV. PG. 120, 121.
Ⓥ Brown Bridge Mills Inc., Troy, Ohio.
Ⓥ Connecticut Hard Rubber Co., 407 East St., New Haven 9, Conn.
Ⓥ Continental Diamond Fibre Co., 16 Chapel St., Newark 16, Del.
Ⓥ Crane Packing Co., 1800 Cuyler Ave., Chicago 13, Ill.
Dobeckmun Co., The, Industrial Products Div., Cleveland 1, Ohio.
Ⓥ Dow Corning Corp., Midland, Mich.
Ⓥ du Pont de Nemours & Co., Inc., E. I., Wilmington, Delaware.
Ⓥ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
Ⓥ GENERAL ELECTRIC CO., Chemical Dept., Pittsfield, Mass. ADV. PG. 5 to 18.
Ⓥ Industrial Tape Corp., New Brunswick, N. J.
Ⓥ Insulation Manufacturers Corp., 565 W. Washington Blvd., Chicago 6, Ill.
Ⓥ Johns-Manville, 22 E. 40th St., New York 16, N. Y.
Ⓥ Keasbey & Mattison, Ambler, Pa.
Ⓥ Linton & Bros. Inc., Horace, 3081 Ruth St., Philadelphia 34, Pa.
Ⓥ Macallen Co., The, 16 Macallen St., Boston 27, Mass.
Mica Fabricating Co., 53 Central Ave., Rochelle Park, N. J.
Ⓥ MICA INSULATOR CO., Schenectady 1, N. Y. ADV. PG. 232.
Ⓥ Minnesota Mining & Mfg. Co., 900 Fauquier Ave., St. Paul 6, Minn.
Ⓥ National Electric Coil Co., Columbus 16, Ohio.
Ⓥ NATIONAL VARNISHED PRODUCTS CORP., 211 Randolph Ave., Woodbridge, N. J. ADV. PG. 248.
Ⓥ U. S. Rubber Co., 1230 Avenue of the Americas, New York 20, N. Y.
Ⓥ Wright & Sons Co., Wm. E., West Warren, Mass.

INSULATORS—Antenna Insulators & Spring Assemblies

Ⓥ Aeronautical Radio Mfg. Co., 155 First Street, Mineola, N. Y.
Birnbach Radio Co., Inc., 145 Hudson St., New York, N. Y.
Ⓥ FLADER, INC., FREDERIC, North Tonawanda, N. Y. ADV. PG. 240.
Ⓥ GENERAL CERAMICS & STEATITE CORP., Keasbey, N. J. ADV. PG. 219.
Insulation Mfg. Co., 11 New York Ave., Brooklyn, N. Y.
Ⓥ Isolantite Mfg. Corp., Stirling, N. J.
Ⓥ J F D MFG. CO., 6101-23 Sixteenth Ave., Brooklyn, N. Y. ADV. PG. 254, 264.
Ⓥ Johnson Co., E. F., Waseca, Minn.
Ⓥ Kings Electronics Co., Inc., 811 Lexington Ave., Brooklyn 21, N. Y.
Ⓥ Lapp Insulator Co., Inc., Radio Specialties Div., 31 Gilbert St., LeRoy, N. Y.
Ⓥ Locke Incorporated, P. O. Box 57, Baltimore 3, Md.
Ⓥ Mueller Electric Co., 1583 E. 31st St., Cleveland 14, Ohio.
Ⓥ Mykroy, Inc., Arlington Heights Airport, Arlington Heights, Ill.
Ⓥ Penmar Prods. Div., Chisholm-Ryder Co., Inc., Niagara Falls 2, N. Y.
Ⓥ Smith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.
Ⓥ Taylor Fibre Co., Norristown, Pa.
Ⓥ TECHNICAL APPLIANCE CORP., Sherburne, N. Y. ADV. PG. 201.
Ⓥ Ward Products Corp., Div. of the Gabriel Co., 1523 E. 45th St., Cleveland 3, Ohio.
Ⓥ Wind Turbine Co., Tower & Antenna Div., E. Market St. & Penna. R. R., West Chester, Pa.

INSULATORS—Can Liner

Acme Folding Box Co., Inc., 141 E. 25th St., New York, N. Y.
Lamicoid Fabricators, Inc., 4545 Cortland St., Chicago 39, Ill.
Ⓥ Irvington Varnish & Insulator Co., 10 Argyle Terrace, Irvington 11, N. J.
Ⓥ Moore Co., Howard J., 108 Park Row, New York 7, N. Y.
Ⓥ PRECISION PAPER TUBE CO., 2033 W. Charleston St., Chicago 47, Ill. ADV. PG. 215.
Ⓥ Rogers Corporation, Manchester, Conn.
Vokar Corp., 7300 Huron River Drive, Dexter, Mich.

INSULATORS—Ceramic

Ⓥ AMERICAN LAVA CORP., Chattanooga 5, Tenn. ADV. PG. 27.
Birnbach Radio Co., Inc., 145 Hudson St., New York, N. Y.
Ⓥ Bud Radio, Inc., 2118 E. 55th St., Cleveland 3, Ohio.
Ⓥ CAMBRIDGE THERMIONIC CORP., 445 Concord Ave., Cambridge, Mass. ADV. PG. 72.
Ⓥ Crowley & Co., Inc., Henry L., 1 Central Ave., West Orange, N. J.
Ⓥ ELECTRICAL INDUSTRIES, INC., 44 Sumner Ave., Newark 4, N. J. ADV. PG. 217.
Electronic Mechanics, Inc., 70 Clifton Blvd., Clifton, N. J.
Ⓥ GENERAL CERAMICS & STEATITE CORP., Keasbey, N. J. ADV. PG. 219.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Hardie Rubbing & Terminal Co., Inc., P. O. Box 91, Orange, N. J.

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

Ⓥ Isolantite Mfg. Corp., Stirling, N. J.
Ⓥ Johnson Co., E. F., Waseca, Minn.
Ⓥ Kirchberger & Co., Inc., M., 1425 37th St., Brooklyn 18, N. Y.
Ⓥ Laminia Corp., 37 S. 6th St., Newark 7, N. J.
Ⓥ Lapp Insulator Co., Inc., Radio Specialties Div., 31 Gilbert St., LeRoy, N. Y.
Ⓥ Locke Incorporated, P. O. Box 57, Baltimore 3, Md.
Ⓥ Loutfan Mfg. Co., East Liverpool, Ohio.
Mica Fabricating Co., 53 Central Ave., Rochelle Park, N. J.
Ⓥ MYCALEX CORP. OF AMERICA, 60 Clifton Blvd., Clifton, N. J. ADV. PG. 163.
Ⓥ Mykroy, Inc., Arlington Heights Airport, Arlington Heights, Ill.
Ⓥ National Ceramic Co., 400 Southard St., Trenton 2, N. J.
Ⓥ Norton Co., 1 New Bond St., Worcester 6, Mass.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
Ⓥ Scintilla Magneto Div. of Bendix Aviation Corp., Sidney, N. Y.
Ⓥ Star Porcelain Co., 62 Muirhead Ave., Trenton 9, N. J.
Ⓥ Steward Mfg. Co., D. M., Chattanooga, Tenn.
Ⓥ STUPAKOFF CERAMIC & MFG. CO., Latrobe, Pa. ADV. PG. 147.
Ⓥ Thor Ceramics Inc., 225 Belleville Ave., Bloomfield, N. J.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Ⓥ Wisconsin Porcelain Co., Sun Prairie, Wis.

INSULATORS—*Feeder Spreader*

Ⓥ AMERICAN LAVA CORP., Chattanooga 5, Tenn. ADV. PG. 27.
Birnbach Radio Co., Inc., 145 Hudson St., New York, N. Y.
Ⓥ Bud Radio Inc., 2118 E. 55th St., Cleveland 3, Ohio.
Ⓥ GENERAL CERAMICS & STEATITE CORP., Keasbey, N. J. ADV. PG. 219.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Isolantite Mfg. Corp., Stirling, N. J.
Ⓥ Johnson Co., E. F., Waseca, Minn.
Ⓥ Lapp Insulator Co., Inc., Radio Specialties Div., 31 Gilbert St., LeRoy, N. Y.
Ⓥ Locke Incorporated, P. O. Box 57, Baltimore 3, Md.
Ⓥ Mullen Mfg. Co., James, 150 Exchange St., Malden, Mass.
Ⓥ National Ceramic Co., 400 Southard St., Trenton 2, N. J.
Porcelain, Inc., 95 Mercer St., New York, N. Y.
Steward Mfg. Co., D. M., Chattanooga, Tenn.
Ⓥ Thor Ceramics Inc., 225 Belleville Ave., Bloomfield, N. J.

INSULATORS—*Fused Quartz*

Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ GENERAL ELECTRIC CO., Lamp Dept., Nela Park, Cleveland 12, Ohio. ADV. PG. 5 to 18.
Mica Fabricating Co., 53 Central Ave., Rochelle Park, N. J.
Ⓥ Quartz Products Co., Malden, Mass.
Ⓥ Thermal Syndicate Ltd., 12 E. 46th St., New York 17, N. Y.
Ⓥ Thwing-Albert Instrument Co., 5351 Pulaski Ave., Philadelphia 44, Pa.

INSULATORS—*High Dielectric Paper*

Ⓥ Alme Wire Co., New Haven 14, Conn.
Ⓥ Baer Co., N. S., W Montgomery St., Hillside, N. J.
Brandywine Fibre Co., 15th & Poplar Sts., Wilmington, Del.
Ⓥ CAMBRIDGE THERMIONIC CORP., 445 Concord Ave., Cambridge, Mass. ADV. PG. 72.
Ⓥ CLEVELAND CONTAINER CO., THE, 6201 Barberton Ave., Cleveland 2, Ohio. ADV. PG. 151.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Insulation Manufacturers Corp., 565 W. Washington Blvd., Chicago 6, Ill.
Ⓥ Irvington Varnish & Insulator Co., 10 Argyle Terrace, Irvington 11, N. J.
Mica Fabricating Co., 53 Central Ave., Rochelle Park, N. J.
Ⓥ MICA INSULATOR CO., Schenectady 1, N. Y. ADV. PG. 232.
Ⓥ Moore Co., Howard J., 106 Park Row, New York 7, N. Y.
Ⓥ PRECISION PAPER TUBE CO., 2033 W. Charleston St., Chicago 47, Ill. ADV. PG. 215.
Ⓥ Rogers Corp., Manchester, Conn.
Ⓥ Schweitzer Inc., Peter J., 405 Lexington Ave., New York 17, N. Y.
Ⓥ Stevens Products Inc., Box 88, Main St., East Orange, N. J.
Ⓥ Syncor Products Co., Malden, Mass.
Ⓥ Taylor Fibre Co., Norristown, Pa.
Ⓥ Waldo's, Hampden, Mass.
Ⓥ Wisconsin Porcelain Co., Sun Prairie, Wis.

INSULATORS—*Mast Guy*

Ⓥ CENTRALAB DIV., GLOBE UNION, INC., 900 E. Keefe Ave., Milwaukee 1, Wis. ADV. PG. 64, 65.
Ⓥ GENERAL CERAMICS & STEATITE CORP., Keasbey, N. J. ADV. PG. 219.
Insulation Mfg. Co., 11 New York Ave., Brooklyn, N. Y.
Ⓥ Isolantite Mfg. Corp., Stirling, N. Y.
Ⓥ J. F. D. MFG. CO., e101-23 Sixteenth Ave., Brooklyn, N. Y. ADV. PG. 254, 264.
Ⓥ Lapp Insulator Co., Inc., Radio Specialties Div., 31 Gilbert St., LeRoy, N. Y.
Ⓥ Locke Incorporated, P. O. Box 57, Baltimore 3, Md.
Ⓥ Mullen Mfg. Co., James, 150 Exchange St., Malden, Mass.
Ⓥ Smith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.
Ⓥ Thor Ceramics Inc., 225 Belleville Ave., Bloomfield, N. J.

INSULATORS—*Passthrough & Bushing*

Brandywine Fibre Co., 15th & Poplar Sts., Wilmington, Del.
Ⓥ CAMBRIDGE THERMIONIC CORP., 445 Concord Ave., Cambridge, Mass. ADV. PG. 72.
Ⓥ CENTRALAB DIV., GLOBE UNION, INC., 900 E. Keefe Ave., Milwaukee 1, Wis. ADV. PG. 64, 65.
Ⓥ Citation Products Co., 233 E. 146th St., New York 51, N. Y.
Electronic Mechanics Inc., 70 Clifton Blvd., Clifton, N. J.
Ⓥ GENERAL CERAMICS & STEATITE CORP., Keasbey, N. J. ADV. PG. 219.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Heidor Bushing & Terminal Co., Inc., P. O. Box 91, Orange, N. J.
Ⓥ HERMETIC SEAL PRODUCTS CO., 29-37 S. 6th St., Newark 7, N. J. ADV. PG. 87.
Ⓥ HEYMAN MFG. CO., 300 Michigan Ave., Kenilworth, N. J. ADV. PG. 26.
Ⓥ Industrial Precision Products Co., 315-325 N. Hoyne Ave., Chicago 12, Ill.
Ⓥ Isolantite Mfg. Corp., Stirling, N. J.
Ⓥ Johnson Co., E. F., Waseca, Minn.
Ⓥ Laconia Corp., 37 S. 6th St., Newark 7, N. J.
Ⓥ Lapp Insulator Co., Inc., Radio Specialties Div., 31 Gilbert St., LeRoy, N. Y.
Ⓥ Litton Industries, San Carlos, Calif.
Ⓥ Locke Incorporated, P. O. Box 57, Baltimore 3, Md.
Ⓥ Mullen Mfg. Co., James, 150 Exchange St., Malden, Mass.
Ⓥ MYCALEX CORP. OF AMERICA, 60 Clifton Blvd., Clifton, N. J. ADV. PG. 163.
Ⓥ Mykroy, Inc., Arlington Heights Airport, Arlington Heights, Ill.
Ⓥ PRECISION METAL PRODUCTS CO. OF MALDEN, 342 Eastern Ave., Malden 48, Mass. ADV. PG. 220.
Pointloid, Inc., 95 Mercer St., New York, N. Y.
Ⓥ Steward Mfg. Co., D. M., Chattanooga, Tenn.
Ⓥ STUPAKOFF CERAMIC & MFG. CO., Latrobe, Pa. ADV. PG. 147.
Ⓥ Thor Ceramics Inc., 225 Belleville Ave., Bloomfield, N. J.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Ⓥ Wisconsin Porcelain Co., Sun Prairie, Wis.

INSULATORS—*Standoff & Cone*

Ⓥ AEROLITE ELECTRONIC HARDWARE CORP., 507 26th St., Union City, N. J. ADV. PG. 138.
Ⓥ AMERICAN LAVA CORP., Chattanooga 5, Tenn. ADV. PG. 27.
Beach Precision Parts Co., Boonton, N. J.
Birnbach Radio Co., Inc., 145 Hudson St., New York, N. Y.
Bud Radio Inc., 2118 E. 55th St., Cleveland 3, Ohio.
Ⓥ CAMBRIDGE THERMIONIC CORP., 445 Concord Ave., Cambridge, Mass. ADV. PG. 72.
Ⓥ CENTRALAB DIV., GLOBE UNION INC., 900 E. Keefe Ave., Milwaukee 1, Wis. ADV. PG. 64, 65.
Ⓥ Citation Products Co., 233 E. 146th St., New York 51, N. Y.
Electronic Mechanics Inc., 70 Clifton Blvd., Clifton, N. J.
Ⓥ FLADER, INC., FREDERIC, North Tonawanda, N. Y. ADV. PG. 240.
Ⓥ GENERAL CERAMICS & STEATITE CORP., Keasbey, N. J. ADV. PG. 219.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Heidor Bushing & Terminal Co., Inc., P. O. Box 91, Orange, N. J.
Ⓥ HERMETIC SEAL PRODUCTS CO., 29-37 S. 6th St., Newark 7, N. J. ADV. PG. 87.
Ⓥ House of Television Inc., 40 W. 4th St., New York 14, N. Y.
Ⓥ Industrial Precision Products Co., 315-325 N. Hoyne Ave., Chicago 12, Ill.
Insulation Mfg. Co., 11 New York Ave., Brooklyn, N. Y.
Ⓥ INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
Ⓥ Isolantite Mfg. Corp., Stirling, N. J.
Ⓥ Johnson Co., E. F., Waseca, Minn.
Ⓥ Lapp Insulator Co., Inc., Radio Specialties Div., 31 Gilbert St., LeRoy, N. Y.
Ⓥ Locke Incorporated, P. O. Box 57, Baltimore 3, Md.
Ⓥ Mullen Mfg. Co., James, 150 Exchange St., Malden, Mass.
Ⓥ National Ceramic Co., 400 Southard St., Trenton 2, N. J.
Ⓥ Oak Ridge Products Mfg. Div. of Video Television, Inc., 239 E. 127th St., New York 35, N. Y.
Phelps Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Plastcraft Products Co., 20 Houston St., New York 13, N. Y.
Ⓥ Plastmold Corp., Attleboro, Mass.
Ⓥ Plastoid Corp., 10 Mill Rd., Hamburg, N. J.
Ⓥ PRECISION METAL PRODUCTS CO. OF MALDEN, 342 Eastern Ave., Malden 48, Mass. ADV. PG. 220.
Ⓥ Premax Products Div., Chisholm-Ryder Co., Inc., Niagara Falls 2, N. Y.
Pointloid, Inc., 95 Mercer St., New York, N. Y.
South River Metal Products Co., South River, N. J.
Ⓥ Steward Mfg. Co., D. M., Chattanooga, Tenn.
Ⓥ STUPAKOFF CERAMIC & MFG. CO., Latrobe, Pa. ADV. PG. 147.
Ⓥ Syncor Products Co., Malden, Mass.
Ⓥ Thor Ceramics Inc., 225 Belleville Ave., Bloomfield, N. J.
Ⓥ WINCHESTER ELECTRONICS, INC., Glenbrook, Conn. ADV. PG. 205.
Ⓥ Wisconsin Porcelain Co., Sun Prairie, Wis.

INSULATORS—*Strain*

Ⓥ AMERICAN LAVA CORP., Chattanooga 5, Tenn. ADV. PG. 27.
Birnbach Radio Co., Inc., 145 Hudson St., New York, N. Y.
Brandywine Fibre Co., 15th & Poplar Sts., Wilmington, Del.
Ⓥ CENTRALAB DIV., GLOBE UNION INC., 900 E. Keefe Ave., Milwaukee 1, Wis. ADV. PG. 64, 65.
Ⓥ FLADER, INC., FREDERIC, North Tonawanda, N. Y. ADV. PG. 240.
Ⓥ GENERAL CERAMICS & STEATITE CORP., Keasbey, N. J. ADV. PG. 219.
Ⓥ HEYMAN MFG. CO., 300 Michigan Ave., Kenilworth, N. J. ADV. PG. 26.
Insulation Mfg. Co., 11 New York Ave., Brooklyn, N. Y.
Ⓥ INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
Ⓥ Isolantite Mfg. Corp., Stirling, N. J.
Ⓥ Johnson Co., E. F., Waseca, Minn.
Laminated Plastics Inc., 14838 Euclid Ave., Cleveland 12, Ohio.
Ⓥ Lapp Insulator Co., Inc., Radio Specialties Div., 31 Gilbert St., LeRoy, N. Y.
Ⓥ Locke Incorporated, P. O. Box 57, Baltimore 3, Md.
Ⓥ Macallen Co., The, 16 Macallen St., Boston 27, Mass.
Ⓥ Mullen Mfg. Co., James, 150 Exchange St., Malden, Mass.
Ⓥ Mykroy, Inc., Arlington Heights Airport, Arlington Heights, Ill.
Ⓥ National Ceramic Co., 400 Southard St., Trenton 2, N. J.
Ⓥ Smith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.
Ⓥ Steward Mfg. Co., D. M., Chattanooga, Tenn.
Ⓥ STUPAKOFF CERAMIC & MFG. CO., Latrobe, Pa. ADV. PG. 147.
Ⓥ Thor Ceramics Inc., 225 Belleville Ave., Bloomfield, N. J.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Ⓥ Wind Turbine Co., Tower & Antenna Div., 3 Market St. & Penna. R. R., West Chester, Pa.
Ⓥ Wisconsin Porcelain Co., Sun Prairie, Wis.

INSULATORS—*Test Clip*

Birnbach Radio Co., Inc., 145 Hudson St., New York, N. Y.
Ⓥ INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
Ⓥ Smith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.

INSULATORS—*Thermocouple*

Ⓥ Isolantite Mfg. Corp., Stirling, N. J.
Ⓥ Kirchberger & Co., Inc., M., 1425 37th St., Brooklyn 18, N. Y.
Ⓥ Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
Ⓥ Mykroy, Inc., Arlington Heights Airport, Arlington Heights, Ill.
Ⓥ Steward Mfg. Co., D. M., Chattanooga, Tenn.
Ⓥ STUPAKOFF CERAMIC & MFG. CO., Latrobe, Pa. ADV. PG. 147.
Ⓥ Thwing-Albert Instrument Co., 5351 Pulaski Ave., Philadelphia 44, Pa.
Ⓥ Wheelco Instruments Co., 847 W. Harrison St., Chicago 7, Ill.
Ⓥ Wisconsin Porcelain Co., Sun Prairie, Wis.

INSULATORS—*Tower*

Ⓥ GENERAL CERAMICS & STEATITE CORP., Keasbey, N. J. ADV. PG. 219.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.

(V) indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

(V) Lapp Insulator Co., Inc., Radio Specialties Div., 31 Gilbert St., LeRoy, N. Y.
(V) Locke Incorporated, P. O. Box 57, Baltimore 3, Md.
(V) Mykroy, Inc., Arlington Heights Airport, Arlington Heights, Ill.
(V) Wind Turbine Co., Tower & Antenna Div., E. Market St., & Penna. R. R., West Chester, Pa.
(V) Wisconsin Porcelain Co., Sun Prairie, Wis.

INSULATORS—*Transmitting Antenna*

(V) AMERICAN LAVA CORP., Chattanooga 5, Tenn. ADV. PG. 27.
Burnett & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
(V) CENTRALAB DIV., GLOBE UNION INC., 4400 E. Keefe Ave., Milwaukee 1, Wis. ADV. PG. 64, 65.
(V) CORNING GLASS WORKS, Corning, N. Y. ADV. PG. 134.
(V) FLADER, INC., FREDERIC, North Tonawanda, N. Y. ADV. PG. 240.
(V) GENERAL CERAMICS & STEATITE CORP., Keasbey, N. J. ADV. PG. 219.
(V) Industrial Precision Products Co., 315-325 N. Hoyne Ave., Chicago 12, Ill.
(V) Insulantite Mfg. Corp., Stirling, N. J.
(V) Johnson Co., E. F., Waseca, Minn.
(V) Lapp Insulator Co., Inc., Radio Specialties Div., 31 Gilbert St., LeRoy, N. Y.
(V) Locke Incorporated, P. O. Box 57, Baltimore 3, Md.
(V) Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.
(V) Mykroy, Inc., Arlington Heights Airport, Arlington Heights, Ill.
(V) Premax Products Div., Chisholm-Ryder Co., Inc., Niagara Falls 2, N. Y.
(V) Thor Ceramics, Inc., 225 Belleville Ave., Bloomfield, N. J.
(V) Wisconsin Porcelain Co., Sun Prairie, Wis.

INTEGRATORS—*Electronic*

Applied Science Corp. of Princeton, The, P. O. Box 44, Princeton, N. J.
(V) ARMA CORP., 254 36th St., Brooklyn 32, N. Y. ADV. PG. 146.
(V) ATOMIC INSTRUMENT CO., 160 Charles St., Boston, Mass. ADV. PG. 218.
(V) Commercial Research Labs., Inc., 20 Bartlett Ave., Detroit 3, Mich.
(V) Crystal Research Labs., Inc., 29 Allyn St., Hartford, Conn.
(V) Electronic Associates, Inc., Long Branch, N. J.
(V) Electronic Mechanical Products Co., 13-15-17 N. Virginia Ave., Atlantic City, N. J.
(V) GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
(V) INDUSTRIAL ELECTRONICS, INC., 2457 Woodward Ave., Detroit, Mich. ADV. PG. 255.
(V) Philbrick Researches, Inc., George A., 230 Congress St., Boston 10, Mass.
(V) Radioactive Products, Inc., 3201 E. Woodbridge St., Detroit 7, Mich.
(V) SERVO-TEK PRODUCTS CO., 4 Godwin Ave., Paterson 1, N. J. ADV. PG. 187.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
(V) Standard Electronics Research Corp., 2 East End Ave., New York 21, N. Y.
(V) Technitrol Engineering Co., 3212 Market St., Philadelphia, Pa.
(V) WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

INTERCOMMUNICATION SYSTEMS

(V) Airlectron, Inc., P. O. Box 151, Caldwell, N. J.
(V) ALDEN PRODUCTS CO., 117 N. Main St., Brockton 64, Mass. ADV. PG. 235.
(V) American Communications Corp., 306 Broadway, New York 7, N. Y.
(V) Automatic Electric Sales Corp., 1033 W. Van Buren St., Chicago 7, Ill.
(V) AVIOMETER DIV. OF ROANWELL CORP., 662 Pacific St., Brooklyn 17, N. Y. ADV. PG. 66.
(V) Bell Sound Systems, Inc., 555 Marion Rd., Columbus 7, Ohio.
(V) Bogen Co., Inc., David, 663 Broadway, New York 12, N. Y.
(V) Boom Electric & Amplifier Co., 1227 W. Washington Blvd., Chicago 7, Ill.
(V) Connecticut Telephone & Electric Div., Great American Industries, 20 Brittania St., Meriden, Conn.
(V) Cupper Electronic Products Co., 5106 Frankford Ave., Phila. 24, Pa.
(V) Daima Victor Co., 1414 El Camino Real, San Carlos, California.
(V) Executone, Inc., 415 Lexington Ave., New York 17, N. Y.
(V) Fairchild Recording Equipment Corp., 154th St. & 7th Avenue, Whitestone, N. Y.
(V) Feiler Engineering Co., 1601 S. Federal St., Chicago 16, Ill.
(V) Geotrey Mfg. Co., 171 S. 2nd St., Milwaukee 4, Wis.
(V) Gray Mfg. Co., The, 16 Arbor St., Hartford, Conn.
Hart & Co., Inc., Frederick, 839 Main Ave., Poughkeepsie, N. Y.
Hose-McCann Telephone Co., Inc., 25th St. & 3rd Ave., Brooklyn 32, N. Y.
(V) Intervox Corp., 2701 California Ave., Seattle 6, Wash.
(V) Kellogg Switchboard & Supply Co., 6650 S. Cicero Ave., Chicago 38, Ill.
Lake Mfg. Co., 2323 Chestnut St., Oakland 7, Calif.
(V) Loge Sound Engineers, J. M., 2171 W. Washington Blvd., Los Angeles 7, Calif.
Lyman Electronic Corp., 12 Cass St., Springfield, Mass.
(V) National Intercommunicating Systems, 1531 Devon Ave., Chicago 26, Ill.
(V) Operadio Mfg. Co., 135th & Indiana Sts., St. Charles, Ill.
Plastics & Electronics Co., 272 Northland Ave., Buffalo 8, N. Y.
(V) Racon Electric Co., 52 E. 19th St., New York 3, N. Y.
(V) RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
(V) Rauland-Borg Corp., 3523 W. Addison St., Chicago 18, Ill.
(V) Remler Co., Ltd., 2101 Bryant St., San Francisco, Calif.
(V) Signal Engineering & Mfg. Co., 154-6 W. 14th St., New York, N. Y.
(V) Simpson Mfg. Co., Inc., Mark, 32-28 49th St., Long Island City 3, N. Y.
(V) Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
(V) Talk-A-Phone Mfg. Co., 1512 S. Pulaski Rd., Chicago 23, Ill.
(V) Tel Autograph Corp., 16 W. 61st St., New York 23, N. Y.
Telephonics Corp., Park Ave., Huntington, N. Y.
(V) U. S. Instrument Corp., 409 Broad St., Summit, N. J.
(V) Webster Electric Co., 1900 Clark St., Racine, Wis.
(V) Wheeler Insulated Wire Co., Inc., 150 E. Aurora St., Waterbury 91, Conn.

INVERTERS

(V) AIRPAX PRODUCTS CO., 1024 Greenmount Ave., Baltimore 2, Md. ADV. PG. 275.
American Electroneering Co., 2112 S. La Brea Ave., Los Angeles, Calif.
(V) AMERICAN TELEVISION & RADIO CO., 300 E. Fourth St., St. Paul 1, Minn. ADV. PG. 275.
(V) Continental Electric Co., Inc., 334 Ferry St., Newark 5, N. J.
(V) Cook Electric Co., 2700 Southport Ave., Chicago 14, Ill.
(V) CORNELL-DUBILIER ELECTRIC CORP., South Plainfield, N. J. ADV. PG. 70.
(V) ECLIPSE-PIONEER DIV., BENDIX AVIATION CORP., Teterboro, N. J. ADV. PG. 176.
(V) Elcor, Inc., 1501 W. Congress St., Chicago 7, Ill.
(V) Elgar, Inc., 110 Ionia Ave., N. W., Grand Rapids 2, Mich.
(V) Leland Electric Co., The, 1501 Webster St., Dayton 1, Ohio.
(V) Lorain Products Corp., 1122 F St., Lorain, Ohio.
(V) Radiart Corp., The, 3571 W. 62nd St., Cleveland 2, Ohio.
(V) Rangertone, Inc., 73 Winthrop St., Newark 4, N. J.
(V) RED BANK DIVISION, BENDIX AVIATION CORP., Red Bank, N. J. ADV. PG. 61, 127.
(V) SORENSEN & CO., INC., 375 Fairfield Ave., Stamford, Conn. ADV. PG. 141.
(V) Soundscriber Corp., 146 Munson St., New Haven 4, Conn.
Stancil-Hoffman Corp., 1016 N. Highland Ave., Hollywood 38, Calif.
(V) Varo Mfg. Co., Inc., Box 618, Garland, Texas.
(V) WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

IRONS—*Electric Soldering*

(V) Acme Electric Heating Co., 1217 Washington St., Boston, Mass.
(V) American Electrical Heater Co., 6110 Cass Ave., Detroit 2, Mich.
(V) Drake Electric Works, 3656 Lincoln Ave., Chicago 13, Ill.
(V) Dual-Remote Control Co., Garden City, Mich.
(V) Esler Engineering Co., Inc., 740 S. 13th St., Newark 3, N. J.
(V) ELECTRIC SOLDERING IRON CO., W. Elm St., Deep River, Conn. ADV. PG. 106.
(V) GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
(V) Hexacon Electric Company, 130 W. Clay Ave., Roselle Park, N. J.
(V) INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
(V) Kelnor Mfg. Co., 215 Kearny St., San Francisco 8, Calif.
(V) Kennode Mfg. Co., 161 W. 18th St., New York 11, N. Y.
(V) Kwikheat Mfg. Co., 3722 San Fernando Road, Glendale 4, Calif.
(V) Lenk Mfg. Co., 30 Cummington St., Boston 15, Mass.
(V) Mitchell Industries, Inc., Camp Wolters, Mineral Wells, Texas.
Multi-Products Tool Co., 123 Sussex Ave., Newark 4, N. J.
(V) Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
(V) Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
(V) Stanley Works, The, New Britain, Conn.
(V) Transvision, Inc., 460 North Ave., New Rochelle, N. Y.
(V) Unger Electric Tools, Inc., 615 Ducommun St., Los Angeles 54, Calif.
(V) VULCAN ELECTRIC CO., 80 Holten St., Danvers, Mass. ADV. PG. 226.
(V) Weller Mfg. Co., 806 Packer St., Easton, Pa.

ISOLATION COUPLER—*f-m Antenna*

Electro Engineering & Mfg. Co., 627 W. Alexandrine, Detroit 1, Mich.
(V) Johnson Co., E. F., Waseca, Minn.
(V) RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.

ISOTOPES—*Radioactive*

(V) Nucleonic Corp. of America, The, 497 Union St., Brooklyn 31, N. Y.
(V) Tracerlab, Inc., 130 High St., Boston 10, Mass.
(V) U. S. Radium Corp., 535 Pearl St., New York 7, N. Y.

JACKS

See Plugs and Jacks

JEWELS—*Glass*

(V) BIRD CO., RICHARD H., 1 Spruce St., Waltham, Mass. ADV. PG. 214.
(V) Bud Radio Inc., 2118 E. 55th St., Cleveland 3, Ohio.
(V) FEDERAL SCREW PRODUCTS INC., 224 W. Huron St., Chicago 10, Ill. ADV. PG. 271.
(V) GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
(V) GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
(V) Kilburn Glass Co., Inc., J. P., 22 S. Worcester St., Chartley, Mass.
(V) Smith, Inc., Herman H., 405-44th St., Brooklyn 20, N. Y.
(V) WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

JUMPERS—*Bonding*

(V) Aeronautical Radio Mfg. Co., 155 First St., Mineola, N. Y.
(V) Hallett Mfg. Co., 1601 Florence Ave., Inglewood, Calif.
(V) Rattan Mfg. Co., The, P. O. Box 1745, New Haven 7, Conn.
Star Measurements Co., 442 E. 166th St., New York 56, N. Y.
(V) Whitaker Cable Corp., Kansas City 16, Mo.

KEYERS & COUPLERS

(V) Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.
(V) Boehme Inc., H. O., 915 Broadway, New York 10, N. Y.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Erco Radio Labs, Inc., E. Stewart Ave., Garden City, N. Y.
(V) Gates Radio Co., Quincy, Ill.
(V) McElroy Mfg. Corp., Littleton, Mass.
(V) NORTHERN RADIO CO., INC., 143-145 W. 22nd St., New York 11, N. Y. ADV. PG. 132, 133.
(V) Press Wireless Mfg. Co., Inc., Cantiague Rd., Hicksville, L. I., N. Y.
(V) Ultradyne Electronics, Oswego, Oregon.

KEYS & CODING EQUIPMENT

(V) ALDEN PRODUCTS CO., 117 No. Main St., Brockton 64, Mass. ADV. PG. 235.
(V) Boehme Inc., H. O., 915 Broadway, New York 10, N. Y.
(V) Breico Electronics Corp., 55 Vandam St., New York 13, N. Y.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
(V) Electro-Medical Lab., Inc., Hollston, Mass.
Hose-McCann Telephone Co., Inc., 25th St. and 3rd Ave., Brooklyn 32, N. Y.
(V) Johnson Co., E. F., Waseca, Minn.
(V) McElroy Mfg. Corp., Littleton, Mass.
Ripley Co., Inc., P. O. Box 31, Middletown, Conn.
Telephonics Corp., Park Ave., Huntington, N. Y.
(V) Vibroplex Co., Inc., 833 Broadway, New York, N. Y.

KILOVOLTMETERS

(V) Associated Research, Inc., 3758 W. Belmont, Chicago 18, Ill.
(V) BETA ELECTRIC CORP., 1762 3rd Ave., New York 29, N. Y. ADV. PG. 171.
Bradshaw Instruments Co., 348 Livingston St., Brooklyn 17, N. Y.
(V) Burlington Instrument Co., Burlington, Iowa.
(V) Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.

V indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

V Electric Design & Mfg. Corp., Burlington, Iowa.
Electronic Brazing Co., 140 Sheridan Ave., Montclair, N. J.
V Estwing Mfg. Co., Inc., P. O. Box 596, Indianapolis 6, Ind.
V GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
V HEATH CO., Benton Harbor, Mich. ADV. PG. 219.
V Industrial Devices, Inc., 22 State Rd., Edgewater, N. J.
V Manufacturers Engr. & Equip. Corp., Willow Grove, Pa.
V MARION ELECTRICAL INSTRUMENT CO., Manchester, N. H. ADV. PG. 130.
V Meters, Inc., 915 Westfield Blvd., Indianapolis 20, Ind.
V Oak Ridge Products Mfg. Div. of Video Television, Inc., 234 E. 127th St., New York 35, N. Y.
V RADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
V RAWSON ELECTRICAL INSTRUMENT CO., 111 Potter St., Cambridge 42, Mass. ADV. PG. 154.
V Sensitive Research Instrument Corp., 9 Elm Ave., Mt. Vernon, N. Y.
V SHALLCROSS MFG. CO., 10 Jackson Ave., Collingdale, Pa. ADV. PG. 221.
V Simpson Electric Co., Div. of American Gage & Machine Co., 5200 W. Kinzie St., Chicago 44, Ill.
Star Measurements Co., 442 E. 166th St., New York 56, N. Y.
V SYLVANIA ELECTRIC PRODUCTS, INC., Emporium, Pa. ADV. PG. 246 to 290.
V Triplett Electrical Instrument Co., 286 Harmon Rd., Bluffton, Ohio.
V WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

KLYSTRON

See Tubes

KNOBS—*Plastic Molded*

V ALDEN PRODUCTS CO., 117 No. Main St., Brockton 64, Mass. ADV. PG. 235.
American Insulator Corp., New Freedom, Pa.
V Barber Colman Co., Rockford, Ill.
V Catalin Corp. of America, 1 Park Ave., New York 16, N. Y.
V Colonial Corp., 521 W. 23rd St., New York, N. Y.
V Chicago Die Mold Mfg. Co., 4001 Wrightwood Ave., Chicago 39, Ill.
Cole Herbert C., 19-318 Colony Ave., Boston 22, Mass.
V Communication Molded Products Co., Scranton 5, Pa.
V Cutler-Hammer Inc., 312 S. 12th St., Milwaukee 1, Wis.
V FEDERAL SCREW PRODUCTS INC., 224 W. Huron St., Chicago 10, Ill. ADV. PG. 271.
V GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford 3. ADV. PG. 273.
V GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 49, 49.
Gits Molding Corp., 4600 W. Huron St., Chicago 44, Ill.
Jewelcraft Mfg. Co., 11 New York Ave., Brooklyn, N. Y.
V INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
V J. F. D. MFG. CO., 6101-23 Sixteenth Ave., Brooklyn, N. Y. ADV. PG. 254, 264.
V Mallory, P. R. & Co., Indianapolis, Ind.
V Mallory-Stamping Co., Plymouth, Wisc.
V Marion Mfg. Co., James, 150 Exchange St., Malden, Mass.
V Mershon Co., F. E., Saginaw, Mich.
V Metal Insulator Co., Aircraft Control Div., 335 E. Price St., Philadelphia, Pa.
V North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
V Northern Industrial Chemical Co., 7-11 Elkins St., South Boston 27, Mass.
V PATENT BUTTON CO. OF TENNESSEE, Room 240, Empire Bldg., Knoxville, Tenn. ADV. PG. 276.
V Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
V Plastic-Craft Corp., Allendale, Mich.
V Reiner Co., Inc., 2101 Bryant St., San Francisco 10, Calif.
V RICHARDSON CO., THE, 2767 Lake St., Melrose Park, Ill. ADV. PG. 144.
V ROLAN SALES, 1540 N. Irving Pk., Chicago 14, Ill. ADV. PG. 224.
V Shaw, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.
V Taylor Fibre Co., Norristown, Pa.
Tech-Master Products Co., 441-5 Broadway, New York 13, N. Y.
V Technical Instrument Corp., Lyle Mace Jr., Walnut St., Mass.
V Waterbury Companies, Inc., Waterbury 91, Conn.

KNOBS—*Wooden*

V Philco Corp., Tioga and C Sts., Philadelphia 34, Pa.
Tarleton Corporation, 32 Jay St., 582 St. Clements St., Brooklyn, N. Y.

LACQUER

See Insulating Compounds

LAMINATIONS—*Transformer*

Brandywine Fibre Co., 15th & Poplar Sts., Wilmington, Del.
Eastern Metals Industries, 250 W. 54th St., New York 19, N. Y.
V Eastern Specialty Co., Philadelphia 40, Pa.
V GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
V KOBZY TOOL CO., 1535 N. Dayton Ave., Chicago 22, Ill. ADV. PG. 165.
J. Magni Mfg. Co., Inc., East Rutherford, N. J.
V Magnetic Metals Co., Hayes Ave. at 21st St., Camden, N. J.
Masonite Corp., 111 W. Washington St., Chicago 2, Ill.
V Nepatic Co., Paul R., 641 E. 61st St., Los Angeles 1, Calif.
V RICHARDSON CO., THE, 2767 Lake St., Melrose Park, Ill. ADV. PG. 144.
V Sherman Lamination Co., The, Strafford, Conn.
Vulcanized Fibre Co., Inc., 310 Wheeler St., Tonawanda, N. Y.
V Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
V Super Electric Products Corp., 46 Oliver St., Newark, N. J.
V Thomas & Skinner Steel Products Co., 1122 E. 23rd St., Indianapolis, Ind.
V Thordarson Electric Mfg. Div., Maguire Industries, Inc., 500 W. Huron St., Chicago 10, Ill.
V Wade Electric Products Co., 211 Jacob St., Sturgis, Mich.
V Webster Chicago Corp., 5622 Bloomingdale Ave., Chicago, Ill.
V WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

LANDING SYSTEMS—*Microwave*

V Air Associates, Inc., Teterboro, N. J.
American Electroneering Co., 2212 S. La Brea Ave., Los Angeles, Calif.
V Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Sperry Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
V SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.

LEADS—*Test*

V AEROLITE ELECTRONIC HARDWARE CORP., 507 26th St., Union City, N. J. ADV. PG. 156.
V ALDEN PRODUCTS CO., 117 No. Main St., Brockton 64, Mass. ADV. PG. 235.
Bomac Laboratories, Inc., 33 Hayward St., Boston 24, Mass.
V Cinaudagraph Corp., 1501 Flower St., Philadelphia 30, Pa.
V GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 49, 49.
V INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
V J. F. D. MFG. CO., 6101-23 Sixteenth Ave., Brooklyn, N. Y. ADV. PG. 254, 264.
V Keystone Electronics Co., 50 NZ Franklin St., New York 13, N. Y.
V Kings Electronics Co., Inc., 811 Lexington Ave., Brooklyn 21, N. Y.
Precision Apparatus Co., Inc., 90-27 Horace Harding Blvd., Elmhurst, N. Y.
V Simpson Electric Co., Div. of American Gage & Machine Co., 5200 W. Kinzie St., Chicago 44, Ill.
V Shaw, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.
Star Measurements Co., 442 E. 166th St., New York 56, N. Y.
V Tel Products, Inc., 2098 Pittman St., N. Wa., Washington 7, D. C.

LEATHERETTE

V Holliston Mills, Inc., Norwood, Mass.
V U. S. Rubber Co., 1230 Avenue of the Americas, New York 20, N. Y.

LENSES—*Television*

V Dick Video Corp., P. O. Room 2221, 100 East Ave., New York, N. Y.
V Television Zoomar Corp., Room 2221, 100 East 42nd Ave., New York, N. Y.

LENSES—*Television Magnifying*

Arc Radio Corp., 523 Myrtle Ave., Brooklyn, N. Y.
V Bache & Co., Semon, 636 Greenwich St., New York 14, N. Y.
V Bausch & Lomb Optical Co., 635 St. Paul St., Rochester 2, N. Y.
V Celomat Corp., 521 W. 23rd St., New York, N. Y.
V Delta Miracle Lens Co., 141 President St., Passaic, N. J.
Electrovox Co., Inc., 40 Franklin St., East Orange, N. J.
V Farrand Optical Co., Inc., Bronx Blvd. at 238th St., New York 66, N. Y.
V House of Television 40-W, 4th St., New York 12, N. Y.
V Hunton Plastics Co., 178 S. Van Brunt St., Englewood, N. J.
V Louis Brus, 3543 E. 16th St., Los Angeles 23, Calif.
V Molded Insulation Co., Aircraft Control Div., 335 E. Price St., Philadelphia, Pa.
Polan Industries, 220 Eighth Street, Huntington, W. Va.
V Precision Plastic Products, Inc., 620-30 W. Lake St., Chicago 6, Ill.
Thall Plastic Engineering Co., 165 Chambers St., New York, N. Y.
V Transvision, Inc., 460 North Ave., New Rochelle, N. Y.

LENSES—*Television Projection*

V Bache & Co., Semon, 636 Greenwich St., New York 14, N. Y.
V Bausch & Lomb Optical Co., 635 St. Paul St., Rochester 2, N. Y.
V Farrand Optical Co., Inc., Bronx Blvd. at 238th St., New York 66, N. Y.
Polan Industries, 220 Eighth St., Huntington, W. Va.
V Viewlex, Inc., 35-01 Queens Blvd., Long Island City 1, N. Y.

LIE DETECTORS—*Electronic*

V Associated Research, Inc., 1758 W. Belmont, Chicago 18, Ill.

LIGHTNING ARRESTORS

See Arrestors

LIGHTS—*Dial and Panel*

V AEROLITE ELECTRONIC HARDWARE CORP., 507 26th St., Union City, N. J. ADV. PG. 156.
Aerolux Light Corp., 653 11th Ave., New York 19, N. Y.
V ALDEN PRODUCTS CO., 117 No. Main St., Brockton 64, Mass. ADV. PG. 235.
V American Electronics Corp., 226 N. Fourth St., Columbus 15, Ohio.
V Bud Radio, Inc., 2118 E. 55th St., Cleveland 3, Ohio.
V DIAL LIGHT CO. OF AMERICA, INC., 900 Broadway, New York 3, N. Y. ADV. PG. 58.
V Dowe Mfg. Co., 1713 Hubbard St., Chicago 22, Ill.
V FEDERAL SCREW PRODUCTS, INC., 224 W. Huron St., Chicago 10, Ill. ADV. PG. 271.
V Franklin Mfg. Corp., A. W., 44-20 11th St., Long Island City, N. Y.
V GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford 3. ADV. PG. 273.
V GENERAL ELECTRIC CO., Lamp Dept., Nela Park, Cleveland 12, Ohio. ADV. PG. 5 to 18.
V Hart Mfg. Co., 110 Bartholomew Ave., Hartford 3, Conn.
V Industrial Devices, Inc., 22 State Rd., Edgewater, N. J.
V Johnson Co., E. F., Waseca, Minn.
V Kirkland Co., H. R., The, 8 King St., Morristown, N. J.
V Manis Industries, 310 S. Clementine, Anaheim, Calif.
V Morse Co., Frank W., 1300 Soldiers Field Rd., Boston 35, Mass.
V RUSSELL & STOLL CO., INC., 125 Hudson St., New York 7, N. Y. ADV. PG. 211.
V Shaw, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.
V SYLVANIA ELECTRIC PRODUCTS, INC., Emporium, Pa. ADV. PG. 246 to 290.
V TUNG-SOL LAMP WORKS, INC., 95 Eighth Ave., Newark 4, N. J. ADV. PG. 38.
V WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

LIGHTS—*Photoelectric Source*

Aerolux Light Corp., 653 11th Ave., New York 19, N. Y.
V ALDEN PRODUCTS CO., 117 No. Main St., Brockton 64, Mass. ADV. PG. 235.
V AMERICAN CHRONOSCOPE CORP., 916 W. First St., Mt. Vernon, N. Y. ADV. PG. 84.
V Electronic Control Corp., 1913 E. Forest St., Detroit, Mich.
V Farrand Optical Co., Inc., Bronx Blvd. at 238th St., New York 66, N. Y.
V GENERAL ELECTRIC CO., Lamp Dept., Nela Park, Cleveland 12, Ohio. ADV. PG. 5 to 18.
V Industrial Electronics Co., Inc., Hanover, Mass.
V Lectrolite Mfg. Inc., 19 S. Kent St., Genoa, Ill.

Lumenite Electric Co., 407 So. Dearborn St., Chicago, Ill.
Ⓥ Photobell Company, 116 Nassau St., New York 7, N. Y.
Ripley Co., Inc., P. O. Box 51, Middletown, Conn.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

LIGHTS—*Pilot*

Ⓥ AEROLITE ELECTRONIC HARDWARE CORP., 507 26th St., Union City, N. J. ADV. PG. 198.
Aerolux Light Corp., 653 11th Ave., New York 19, N. Y.
Ⓥ ALDEN PRODUCTS CO., 117 No. Main St., Brockton 64, Mass. ADV. PG. 235.
Ⓥ American Electronics Corp., 226 No. Fourth St., Columbus 15, Ohio.
Ⓥ Cannon Electric Development Co., 3209 Humboldt St., Los Angeles 31, Calif.
Ⓥ Clark Controller Co., The, 1146 E. 152nd St., Cleveland 10, Ohio.
Cole-Hersee Co., 20 Old Colony Ave., Boston 27, Mass.
Ⓥ DIAL LIGHT CO. OF AMERICA, INC., 900 Broadway, New York 3, N. Y. ADV. PG. 50.
Ⓥ Drake Mfg. Co., 1713 Hubbard St., Chicago 22, Ill.
Ⓥ FEDERAL SCREW PRODUCTS INC., 224 W. Huron St., Chicago 10, Ill. ADV. PG. 271.
Ⓥ Franklin Mfg. Corp., A. W., 43-20 34th St., Long Island City, N. Y.
Ⓥ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
Ⓥ GENERAL ELECTRIC CO., Lamp Dept., Nela Park, Cleveland 12, Ohio. ADV. PG. 5 to 18.
Ⓥ Hart Mfg. Co., 110 Bartholomew Ave., Hartford 1, Conn.
Ⓥ Herzog Miniature Lamp Works, Inc., 12-23 Jackson Ave., Long Island City 1, N. Y.
Ⓥ Industrial Devices Inc., 22 State Rd., Edgewater, N. J.
Ⓥ Johnson Co., E. F., Waseca, Minn.
Ⓥ Kirkland Co., H. B., The, 8 King St., Morristown, N. J.
Ⓥ Kulka Electric Mfg. Co., Inc., 30 South St., Mt. Vernon, N. Y.
Ⓥ Marco Industries Co., 210 So. Clementine, Anaheim, Calif.
Ⓥ Morse Co., Frank W., 1300 Soldiers Field Rd., Boston 35, Mass.
Ⓥ North American Electric Lamp Co., 1014 Tyler St., St. Louis 6, Mo.
Ⓥ R. B. M. Division, Esleo Wire Corp., Logansport, Ind.
Ⓥ RUSSELL & STOLL CO., INC., 125 Barclay St., New York 7, N. Y. ADV. PG. 211.
Ⓥ Smith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.
Ⓥ TUNG-SOL LAMP WORKS, INC., 95 Eighth Ave., Newark 4, N. J. ADV. PG. 56.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

LIGHTS—*Signal*

Ⓥ AEROLITE ELECTRONIC HARDWARE CORP., 507 26th St., Union City, N. J. ADV. PG. 198.
Aerolux Light Corp., 653 11th Ave., New York 19, N. Y.
Ⓥ Air Associates, Inc., Teterboro, N. J.
Ⓥ Allis-Chalmers Mfg. Co., 935 South 70th St., Milwaukee 1, Wis.
Ⓥ American Electronics Corp., 266 N. Fourth St., Columbus 15, Ohio.
Ⓥ Amglo Corp., 4234 Lincoln Ave., Chicago 18, Ill.
Ⓥ Cannon Electric Development Co., 3209 Humboldt St., Los Angeles 31, Calif.
Ⓥ DIAL LIGHT CO. OF AMERICA, INC., 900 Broadway, New York 3, N. Y. ADV. PG. 50.
Ⓥ Drake Mfg. Co., 1713 Hubbard St., Chicago 22, Ill.
Ⓥ FEDERAL SCREW PRODUCTS INC., 224 W. Huron St., Chicago 10, Ill. ADV. PG. 271.
Ⓥ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
Ⓥ GENERAL ELECTRIC CO., Lamp Dept., Nela Park, Cleveland 12, Ohio. ADV. PG. 5 to 18.
Ⓥ Industrial Devices Inc., 22 State Rd., Edgewater, N. J.
Ⓥ Johnson Co., E. F., Waseca, Minn.
Ⓥ Kemlite Labs., 1619 W. Grand Ave., Chicago 22, Ill.
Ⓥ Kirkland Co., H. B., The, 8 King St., Morristown, N. J.
Ⓥ Kulka Electric Mfg. Co., Inc., 30 South St., Mt. Vernon, N. Y.
Lumenite Electric Co., 407 S. Dearborn St., Chicago, Ill.
Ⓥ Marco Industries Co., 210 So. Clementine, Anaheim, Calif.
Ⓥ Smith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

LIGHTS—*Stroboscopic Source*

Aerolux Light Corp., 653 11th Ave., New York 19, N. Y.
Ⓥ Amglo Corp., 4234 Lincoln Ave., Chicago 18, Ill.
Ⓥ Communication Measurements Lab., Inc., 120 Greenwich St., New York, N. Y.
Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Ⓥ Huggins Laboratories, 734 Hamilton Ave., Menlo Park, Calif.
Ⓥ Kemlite Labs., 1619 W. Grand Ave., Chicago 22, Ill.
Ⓥ North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
Ⓥ O'Connor & Co., John T., West Orange, N. J.
Ⓥ SYLVANIA ELECTRIC PRODUCTS, INC., 1740 Broadway, New York 19, N. Y. ADV. PG. 286 to 290.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

LINKS—*Antenna*

Ⓥ Aeronautical Radio Mfg. Corp., 155 First St., Mineola, N. Y.
Ⓥ Andrew Corp., 363 E. 75th St., Chicago 19, Ill.
Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ Johnson Co., E. F., Waseca, Minn.
Ⓥ Product Development Co., Inc., Arlington, N. J.
Ⓥ U. S. ELECTRONICS CORP., 276 Warren St., Lyndhurst, N. J. ADV. PG. 266.
Ⓥ Ward Products Corp., Div. of The Gabriel Corp., 1523 E. 45th St., Cleveland 3, Ohio.
Ⓥ Wind Turbine Co., Tower & Antenna Div., E. Market St. & Penna. R. R., West Chester, Pa.

LITHIUM COMPOUNDS

See Metals

LOCATORS—*Electronic Metal Locators & Detectors*

Ⓥ Allis Chalmers Mfg. Co., 935 South 70th St., Milwaukee 1, Wis.
Engineering Lab., Inc., 602 E. 4th St., Tulsa 3, Okla.
Fisher Research Lab., 1961 University Ave., Palo Alto, Calif.
Globe Phone Mfg. Co., 2 Linden St., Reading, Mass.
Ⓥ Radiation Counter Laboratories, Inc., 1844 W. 21st St., Chicago 8, Ill.
Ⓥ Racon Electric Co., 52 E. 19th St., New York 3, N. Y.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
Ⓥ RADIO FREQUENCY LABS., INC., Boonton 2, N. J. ADV. PG. 172.

LOCATORS—*Power Line Failure*

Ⓥ Airlectron, Inc., P. O. Box 151, Caldwell, N. J.
Ⓥ Deutschmann Corp., Tobe, 921 Providence Highway, Norwood, Mass.
Ⓥ Electronic Associates, Inc., Long Branch, N. J.
Eitron Inc., 407 N. Jackson St., Jackson, Mich.
Ⓥ Hathaway Instrument Co., 1315 S. Clarkson St., Denver 10, Colo.
Jarvis Electronics Corp., 6058 W. Fullerton Ave., Chicago 39, Ill.
Ⓥ Radar Engineers, 110 University Place, Seattle 1, Wash.

LOCATORS—*Radio Interference*

Ⓥ Deutschmann Corp., Tobe, 921 Providence Highway, Norwood, Mass.
Eitron, Inc., 407 N. Jackson St., Jackson, Mich.
Ⓥ Ferris Instrument Co., 110 Cornelia St., Boonton, N. J.
Ⓥ MEASUREMENTS CORP., Boonton, N. J. ADV. PG. 145.
Ⓥ Sprague Electric Co., North Adams, Mass.

LOCKS—*Dial*

Ⓥ Bud Radio, Inc., 2118 E. 55th St., Cleveland 3, Ohio.
Ⓥ CAMBRIDGE THERMIONIC CORP., 445 Concord Ave., Cambridge, Mass. ADV. PG. 72.
Ⓥ Citation Products Co., 233 E. 146th St., New York 51, N. Y.
Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Ⓥ Johnson Co., E. F., Waseca, Minn.
Ⓥ Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.
Ⓥ NATIONAL CO., INC., 61 Sherman St., Malden 48, Mass. ADV. PG. 33 to 36.

LOCKS—*Shaft*

Ⓥ Bud Radio, Inc., 2118 E. 55th St., Cleveland 3, Ohio.
Ⓥ CAMBRIDGE THERMIONIC CORP., 445 Concord Ave., Cambridge, Mass. ADV. PG. 72.
Ⓥ Citation Products Co., 233 E. 146th St., New York 51, N. Y.
Ⓥ Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.
Ⓥ NATIONAL CO., INC., 61 Sherman St., Malden 48, Mass. ADV. PG. 33 to 36.

LORAN NAVIGATIONAL DEVICES

Ⓥ Cossor (Canada) Ltd., 301-303 Windsor St., Halifax, N. S., Canada.
Ⓥ HARVEY RADIO LABS., INC., 447 Concord Ave., Cambridge, Mass. ADV. PG. 104.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Radiomarine Corp. of America, 75 Varick St., New York 13, N. Y.
Ⓥ SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. Adv. Pg. 85, 86.
VECTRON, INC., 235 High St., Waltham, Mass. ADV. PG. 266.
Z & W Machine Products Inc., Electronics Div., 5151 St. Clair Ave., Cleveland 3, Ohio.

LOUDSPEAKER DRIVER UNITS

Ⓥ Altec Lansing Corp., 161 Avenue of the Americas, New York 13, N. Y.
Ⓥ Atlas Sound Corp., 1443 39th St., Brooklyn 18, N. Y.
Ⓥ Commercial Radio Sound Corp., 575 Lexington Ave., New York 22, N. Y.
Ⓥ Dilks Co., The, Seymour, Conn.
Ⓥ ELECTRO-VOICE, INC., Buchanan, Mich. ADV. PG. 207.
Ⓥ JENSEN MFG. CO., 6601 S. Laramie Ave., Chicago 38, Ill. ADV. PG. 91.
Ⓥ Lansing Sound, Inc., James B., 2439 Fletcher Drive, Los Angeles 26, Calif.
Ⓥ Operadio Mfg. Co., 135th & Indiana Sts., St. Charles, Ill.
Ⓥ Racon Electric Co., 52 E. 19th St., New York 3, N. Y.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
Radio-Music Corp., Port Chester, N. Y.
Ⓥ Signet Development Co., 188 W. Randolph St., Chicago 1, Ill.
Stephens Mfg. Corp., 8538 Warner Drive, Culver City, Calif.
Ⓥ UNIVERSITY LOUDSPEAKERS INC., 80 S. Kensico Ave., White Plains, N. Y. ADV. PG. 231.

LOUDSPEAKERS

Ⓥ Altec Lansing Corp., 161 Avenue of the Americas, New York 13, N. Y.
Ⓥ Best Mfg. Co., Inc., 1200 Grove St., Irvington 11, N. J.
Ⓥ Bozak, R. T., 90 Montrose Ave., Buffalo 14, N. Y.
Ⓥ British Industries Corp., 164 Duane St., New York 13, N. Y.
Brociner Electronics Laboratory, 1546 Second Ave., New York 28, N. Y.
Ⓥ Carbonneau Industries, Inc., Grand Rapids, Mich.
Ⓥ Cinaudagraph Speakers, Inc., Division of Airex Mfg. Corp., 1401 Fairfax Trafficway, Kansas City, Kansas.
Cleveland Electronics, Inc., 6611 Euclid Ave., Cleveland, Ohio.
Ⓥ Commercial Radio Sound Corp., 575 Lexington Ave., New York 22, N. Y.
Ⓥ Crescent Industries, Inc., 4140 Belmont Ave., Chicago 41, Ill.
Dx Radio Products Co. Inc., 2304 Armitage Ave., Chicago 47, Ill.
Ⓥ Delco Radio Div., General Motors Corp., Kokomo, Ind.
Ⓥ Dilks Co., The, Seymour, Conn.
Ⓥ ELECTRO-VOICE, INC., Buchanan, Mich. ADV. PG. 207.
Ⓥ Galbraith & Son, Inc., C. C., 450-454 Avenue of the Americas, New York 11, N. Y.
Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
Ⓥ Goodmans Industries, Ltd., Lancelot Rd., Wembley, Middlesex, England.
Hartley Co., Ltd., H. A., 152 Hammersmith Rd., London W. 6, England.
Ⓥ Hull Audio Industries, Hollywood Station Box 1230, Hollywood 28, Calif.
Ⓥ Horton Machine Products Co., Horton & Rockaway Aves., Valley Stream, N. Y.
Ⓥ JENSEN MFG. CO., 6601 S. Laramie Ave., Chicago 38, Ill. ADV. PG. 91.
Ⓥ Kellogg Switchboard & Supply Co., 6650 S. Cicero Ave., Chicago 38, Ill.
Ⓥ Lansing Sound Inc., James B., 2439 Fletcher Drive, Los Angeles 26, Calif.
Ⓥ Magnavox Co., The, Components Div., Fort Wayne 4, Ind.
Ⓥ Mellaphone Corp., Rochester 2, N. Y.
Ⓥ Molded Insulation Co., Aircraft Control Div., 335 E. Price St., Phila., Pa.
Ⓥ North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
Ⓥ Operadio Mfg. Co., 135th and Indiana Sts., St. Charles, Ill.
Ⓥ Oxford Electric Corp., 3911 S. Michigan Ave., Chicago 15, Ill.
Ⓥ Permoflux Corp., 4900 W. Grand Avenue, Chicago 39, Ill.
Ⓥ Philco Corp., Tioga and C Sts., Philadelphia 34, Pa.
Ⓥ PICKERING & CO., 309 Woods Ave., Oceanside, L. I., N. Y. ADV. PG. 234.
Ⓥ QUAM NICHOLS CO., 526 E. 33rd Pl., Chicago 16, Ill. ADV. PG. 251.
Ⓥ Racon Electric Co., 52 E. 19th St., New York 3, N. Y.

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
Radio Music Corp., Port Chester, N. Y.
Ⓥ NOLA CO., INC., THE, 2530 Superior Ave., Cleveland 14, Ohio. ADV. PG. 43.
Ⓥ Triplet Development Co., 188 W. Randolph St., Chicago 1, Ill.
Ⓥ Soundbirder Corp., 146 Munson St., New Haven 4, Conn.
Stephens Mfg. Corp., 8538 Warner Drive, Culver City, Calif.
Ⓥ Sterling Engineering Co., Laconia, N. H.
Tayborn Equipment Co., Inc., 120 Greenwich St., New York, N. Y.
Ⓥ UNIVERSITY LOUDSPEAKERS, INC., 80 S. Kensico Ave., White Plains, N. Y. ADV. PG. 211.
Utah, Inc., E. Franklin St., Huntington, Ind.
Ⓥ Zenith Radio Corp., 6001 Dickens Ave., Chicago 39, Ill.

LOUDSPEAKERS—*Marine Speaker Systems*

Ⓥ Altec Lansing Corp., 161 Avenue of the Americas, New York 13, N. Y.
Ⓥ American Communications Corp., 506 Broadway, New York 7, N. Y.
Ⓥ Atlas Sound Corp., 1443 39th St., Brooklyn 18, N. Y.
Ⓥ Chicagograph Speakers, Inc., Division of Arvin Mfg. Corp., 1401 Fairfax Trafficway, Kansas City, Kans.
Ⓥ Dix Radio Products Co., Inc., 2304 Armitage Ave., Chicago 47, Ill.
Ⓥ Gates Co., The, Seymour, Conn.
Ⓥ Halbrath & Sons, Inc., C. C., 350-58 Avenue of the Americas, New York 13, N. Y.
Ⓥ Hush-McCook Telephone Co., Inc., 25th St. and 3rd Ave., Brooklyn 32, N. Y.
Ⓥ Intervox Corp., 2701 California Ave., Seattle 6, Wash.
Ⓥ JENSEN MFG. CO., 6601 S. Laramie Ave., Chicago 38, Ill. ADV. PG. 45.
Ⓥ Kevin Electric Co., 62 E. 14th St., New York 3, N. Y.
Ⓥ Radiomarine Corp. of America, 75 Varick St., New York 13, N. Y.
Ⓥ Remler Co., Ltd., 2101 Bryant St., San Francisco 10, Calif.
Ⓥ Triplet Development Co., 188 W. Randolph St., Chicago 1, Ill.
Stephens Mfg. Corp., 8538 Warner Drive, Culver City, Calif.
Tayborn Equipment Co., Inc., 120 Greenwich St., New York 6, N. Y.
Ⓥ UNIVERSITY LOUDSPEAKERS, INC., 80 S. Kensico Ave., White Plains, N. Y. ADV. PG. 211.
Western Sound & Electric Labs., Inc., 805 S. Flow St., Milwaukee 4, Wis.

LOUDSPEAKERS—*Tweeters & Woofers*

Ⓐ Altec Lansing Corp., 161 Avenue of the Americas, New York 13, N. Y.
Ⓐ Atlas Sound Corp., 1443 39th St., Brooklyn 18, N. Y.
Ⓐ Bozak, R. T., 90 Montauk Ave., Buffalo 14, N. Y.
Ⓐ British Industries Corp., 164 Duane St., New York 13, N. Y.
Ⓐ Chicagograph Speakers, Inc., Division of Arvin Mfg. Corp., 1401 Fairfax Trafficway, Kansas City, Kans.
Commercial Radio Sound Corp., 570 Lexington Ave., New York 22, N. Y.
Ⓥ ELECTRO VOICE, INC., Buchanan, Mich. ADV. PG. 207.
Ⓐ Hall Audio Industries, Hollywood Station Box 1830, Hollywood 28, Calif.
Ⓥ JENSEN MFG. CO., 6601 S. Laramie Ave., Chicago 38, Ill. ADV. PG. 45.
Ⓐ Klipsch & Associates, Hope, Ark.
Ⓐ Lansing Sound, Inc., James B., 2439 Fletcher Drive, Los Angeles 26, Calif.
Ⓐ Magnavox Co., The, Components Div., Fort Wayne 4, Ind.
Ⓐ Racon Electric Co., 52 E. 19th St., New York 3, N. Y.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
Ⓐ Stillman Mfg. Co., Inc., Main, 32-08 49th St., Long Island City 3, N. Y.
Stephens Mfg. Corp., 8538 Warner Drive, Culver City, Calif.
Ⓥ UNIVERSITY LOUDSPEAKERS, INC., 80 S. Kensico Ave., White Plains, N. Y. ADV. PG. 211.

LUBRICANTS—*Dry Film*

Ⓐ Acheson Colloids Corp., Port Huron, Mich.
Ⓐ Sprayt Colloids Corp., Dayton, O.

LUGS AND TERMINALS

Ⓐ AEROLITE ELECTRONIC HARDWARE CORP., 687 East 135th St., New York 54, N. Y. ADV. PG. 179.
Ⓐ Aircraft Marine Products, Inc., 2421 N. Fourth St., Harrisburg, Pa.
Ⓐ American Electric Cable Co., 591 Appleton St., Holyoke, Mass.
Ⓐ Best Chain Mfg. Co., 110 Mountain Grove St., Bridgeport 5, Conn.
Ⓐ Bender Mfg. Co., 4647 W. Van Buren St., Chicago 44, Ill.
Bimbach Radio Co., Inc., 145 Hudson St., New York, N. Y.
Ⓐ Blue Mfg. Co., 4591 Lorain Ave., Cleveland 9, Ohio.
Ⓐ BUCHANAN ELECTRICAL PRODUCTS CORP., 1290 Central Ave., Hillside, N. J. ADV. PG. 214.
Ⓐ Burndy Engineering Co., Inc., 107 Bruckner Blvd., New York 54, N. Y.
Ⓐ CAMBRIDGE THERMIONIC CORP., 445 Concord Ave., Cambridge, Mass. ADV. PG. 72.
Ⓐ CINCH MFG. CORP., 1026 S. Homan Ave., Chicago 24, Ill. ADV. PG. 154.
Ⓐ Citation Products Co., 233 E. 146th St., New York 51, N. Y.
Cole-Hersee Co., 20 Old Colony Ave., Boston 27, Mass.
Ⓐ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Ⓐ Dante Electric Mfg. Co., Bantam, Conn.
Ⓐ FEDERAL SCREW PRODUCTS INC., 224 W. Huron St., Chicago 10, Ill. ADV. PG. 272.
Ⓐ Frankel Connector Co., 177 Hudson St., New York, N. Y.
Ⓐ Franklin Mfg. Corp., A. W., 48-20 34th St., Long Island City, N. Y.
Ⓐ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
Ⓐ GENERAL ELECTRIC CO., Construction Materials Dept., 1285 Boston Ave., Bridgeport 2, Conn. ADV. PG. 5 to 10.
Ⓐ Grammes & Son, L. F., 169 Union St., Allentown 2, Pa.
Ⓐ Greene Mfg. Corp., G. G., Warren, Pa.
Ⓐ Gregory Mfg. Co., Inc., The, 61 Franklin St., New Haven 11, Conn.
Ⓐ Hallett Mfg. Co., 1602 Florence Ave., Inglewood, Calif.
Ⓐ HEYMAN MFG. CO., 100 Madison Ave., Kenilworth, N. J. ADV. PG. 78.
Ⓐ Industrial Retaining Ring Co., 215-325 N. Hoyne Ave., Chicago 12, Ill.
Ⓐ INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
Ⓐ Johnson Co., E. F., Waseca, Minn.
Ⓐ Keystone Electronics Co., 50-52 Franklin St., New York 13, N. Y.
Ⓐ Kurlon Electric Mfg. Co., 151 New Jersey Railroad Ave., Newark 5, N. J.
Ⓐ Parks Engineering Mfg. Co., Inc., 10 Speer St., Mt. Vernon, N. Y.
LaMarche Mfg. Co., 1121 East Rosecrans Ave., Los Angeles 59, Calif.
Ⓐ Lyon, Inc., Harry, 3140 Lawrence Ave., Chicago 40, Ill.
Ⓐ Mayer Co., Frank R., 1800 Gallatin Park Rd., Bay St. Louis, Miss.
Ⓐ National Screw & Mfg. Co., Cleveland 4, Ohio.
Ⓐ Pacific Screw Co., 5133 Bandini Blvd., Los Angeles 22, Calif.
Ⓐ Pollack Co., Walter H., 5106 Santa Monica Blvd., Beverly Hills, Calif.
Ⓐ Sherman Mfg. Co., H. B., 27 Nadley St., Battle Creek, Mich.
Ⓐ Smith, Inc., Herman H., 600-4400 St., Brooklyn 20, N. Y.
Ⓐ Stanley Mfg. Co., Nathan K., 205 Pasadena Ave., S. Pasadena, Calif.
Ⓐ Stanford Electric Tube Co., 89 Lower St., Spring Field, Mass.
Ⓐ Stimpson Co., Inc., Edwin B., 74 Franklin Ave., Brooklyn 5, N. Y.
Ⓐ Thomas & Betts Co., Inc., 36 Butler St., Elizabeth 1, N. J.
Ⓐ Tinnerman Co., Div. of United-Carr Fastener Corp., 459 Waterman St., Newtonville, Mass.
Ⓐ United-Carr Fastener Corp., Cambridge 42, Mass.
Ⓐ United Shoe Machinery Corp., 140 Federal St., Boston, Mass.
Ⓐ Waldes Electric Products Co., 211 Jacob St., Sturgis, Mich.
Ⓐ Waterbury Companies, Inc., Waterbury 90, Conn.
Ⓐ Wheaton Co., T. C., Industrial Div., 220 G St., Millville, N. J.
Ⓐ Wisconsin Cable Corp., Kansas City 16, Mo.
Zierick Mfg. Corp., Brechwood and Rowland Aves., New Rochelle, N. Y.

MACHINES—*Blueprint*

Ⓐ Bergen Co., Eugene, 2425 Sheffield Ave., Chicago 14, Ill.
Ⓐ Charles Beseler Corp., 71 South Ave., Rochester 4, N. Y.
Ⓐ Hesse Co., C. F., 1801 W. Irving Park Rd., Chicago, Ill.
Ⓐ Peck & Harvey, 5736-38 W. Western Ave., Chicago 36, Ill.
Ⓐ Post Co., Frederick, 3650 N. Avondale Ave., P. O. Box 804, Chicago 80, Ill.

MACHINES—*Coil Winding*

Ⓐ Associated Production Co., 162 N. Clinton St., Chicago 6, Ill.
Ⓐ Automatic Coil Winder & Electrical Equipment Co., Ltd., Winder House, Douglas St., London, S. W. 1, England.
Ⓐ Boesch Mfg. Co., Danbury, Conn.
Ⓐ Elster Engineering Co., Inc., 740 S. 13th St., Newark 3, N. J.
Ⓐ Ideal Industries, Inc., Park and Borden Aves., Sycamore, Ill.
Ⓐ KAHLE ENGINEERING CO., 1307 7th St., North Bergen, N. J. ADV. PG. 160, 161.
Ⓐ MICO INSTRUMENT CO., 80 Trowbridge St., Cambridge 38, Mass. ADV. PG. 263.
Ⓐ PRODUCTION EQUIPMENT CO., Coil Winding Machine Div., 32 W. Main St., Oyster Bay, N. Y. ADV. PG. 254.
Ⓐ STEVENS MFG. CO., INC., GEO., 6022 N. Rogers Ave., Polask and Peterson, Chicago 30, Ill. ADV. PG. 277.
Ⓐ Stolle Engineering & Mfg. Co., 3919 S. Grand Ave., Los Angeles 37, Calif.
Ⓐ Universal Winding Co., 1655 Elmwood Ave., Cranston 3, R. I.
Weymouth Instrument Co., 1440 Commercial St., East Weymouth 89, Mass.

MACHINES—*Crystal Disc Lapping & Manufacturing*

Ⓐ Ace Parking Co., 1800 Cuyler Ave., Chicago 13, Ill.
Ⓐ Polytech Devices, Inc., 11804½ E. Grand St., Elizabeth, N. J.
Premier Crystal Labs., Inc., 79-89 Seventh Ave., New York 11, N. Y.
Ⓐ REEVES HOFFMAN CORP., 321 Cherry St., Carlisle, Pa. ADV. PG. 32.

MACHINES—*Crystal Manufacturing & Finishing*

Ⓐ Polytech Devices, Inc., 11804½ E. Grand St., Elizabeth, N. J.
Premier Crystal Labs., Inc., 79-89 Seventh Ave., New York 11, N. Y.
Ⓐ REEVES-HOFFMAN CORP., 321 Cherry St., Carlisle, Pa. ADV. PG. 32.

MACHINES—*Electric Soldering*

Ⓐ Ace Radio Works, 86 Westville Ave., Caldwell, N. J.
Ⓐ Elster Engineering Co., Inc., 740 S. 13th St., Newark 3, N. J.
Ⓐ ELECTRIC SOLDERING IRON CO., W. Elm St., Deep River, Conn. ADV. PG. 106.
Ⓐ Electronic Engineering Corp., 624 Ridge Rd., Lyndhurst, N. J.
Ⓐ Ideal Industries, Inc., Park and Borden Aves., Sycamore, Ill.
Ⓐ KAHLE ENGINEERING CO., 1307 7th St., North Bergen, N. J. ADV. PG. 160, 161.
Ⓐ Lyon Electric Equipment Co., Box 137, Toledo 1, Ohio.
Multi-Products Tool Co., 123 Sussex Ave., Newark 4, N. J.
Ⓐ Polytech Devices, Inc., 11804½ E. Grand St., Elizabeth, N. J.
Ⓐ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓐ Stolle Engineering & Mfg. Co., 3919 S. Grand Ave., Los Angeles 37, Calif.

MACHINES—*Electronic Balancing*

Ⓐ Arnold Co., R. B., 3101 N. Delaware St., Indianapolis, Ind.
Kelly Co., E. P., P. O. Box 31, Middletown, Conn.
Ⓐ SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 80.
Ⓐ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

MACHINES—*Electronic Beverage Inspector*

Ⓐ RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.

MACHINES—*Electronic Computing*

Ⓐ ARMA CORP., 254 36th St., Brooklyn 32, N. Y. ADV. PG. 146.
Ⓐ BARKER & WILLIAMSON, 236 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓐ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Ⓐ Consolidated Engineering Corp., 620 N. Lake Ave., Pasadena 4, Calif.
Daven Laboratories, Inc., 4705 Queensbury Rd., Riverdale, Md.
Eckert-Mauchly Computer Corp., 3747 Ridge Ave., Philadelphia 32, Pa.
Ⓐ Electronic Associates, Inc., Long Branch, N. J.
Ⓐ Engineering Research Associates, Inc., 1902 W. Minnehaha Ave., St. Paul 4, Minn.
Ⓐ FORD INSTRUMENT CO., INC., 31-10 Thomson Ave., Long Island City, N. Y. ADV. PG. 238.
Ⓐ Hedrick Research, Inc., George A., 210 Congress St., Boston 10, Mass.
Ⓐ Philco Corp., Tioga and C Sts., Philadelphia 34, Pa.

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

Phillips Petroleum Co., Special Products Div., Bartlesville, Okla.
ⓋPOTTER INSTRUMENT CO., INC., 115 Cutter Mill Rd., Great Neck, N. Y. ADV. PG. 204.
ⓋRAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
ⓋReeves Instrument Corp., 215 E. 91st St. New York, N. Y.
ⓋSERVO-TEK PRODUCTS CO., 4 Gubain Ave., Paterson 1, N. J. ADV. PG. 187.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
ⓋThompson & Associates, John E., 7210 S. Yates Ave., Chicago 49, Ill.

MACHINES—*Electronic Dictation*

ⓋBRUSH DEVELOPMENT CO., 3405 Perkins Ave., Cleveland 14, Ohio. ADV. PG. 124, 125.
ⓋDictaphone Corp., 420 Lexington Ave., New York 17, N. Y.
Lekas Mfg. Co., Ann Arbor, Mich.
Molded Insulation Co., Aircraft Control Div., 335 E. Price St., Philadelphia, Pa.
ⓋProctor Soundex Corp., 133 N. 6th Ave., Mt. Vernon, N. Y.

MACHINES—*Engraving and Profiling*

Auto Engraver Co., Inc., 177a Broadway, New York, N. Y.
ⓋGREEN INSTRUMENT CO., 441 Putnam Ave., Cambridge, Mass. ADV. PG. 116.
ⓋMICO INSTRUMENT CO., 80 Trowbridge St., Cambridge 38, Mass. ADV. PG. 263.
ⓋNEW HERMES, INC., 15-19 University Place, New York 3, N. Y. ADV. PG. 247.
ⓋPorts Mfg. Co., 3265 E. Belmont Ave., Fresno 3, Calif.
ⓋPress Engraving Machine Co., R., 649 Highway No. 29, Hillside, N. J.

MACHINES—*Flexible Shaft Equipment*

ⓋDumore Co., The, 1300 Seventeenth St., Racine, Wis.
ⓋElliott Mfg. Co., 218 Prospect Ave., Binghamton, N. Y.
ⓋForedom Electric Co., 27 Park Place, New York 7, N. Y.
J. & R. Mfg. Co., 517 Elm St., Arlington, N. J.
ⓋPratt & Whitney Div., Niles-Bement-Pond Co., West Hartford 1, Conn.
ⓋStow Mfg. Co., 445 State St., Binghamton, N. Y.
ⓋWalker-Turner Div., Kearney & Trecker Corp., 639 South Ave., Plainfield, N. J.
ⓋWhite Dental Mfg. Co., S. S., Industrial Div., 10 E. 40th St., New York, N. Y.

MACHINES—*Glass Blowing*

ⓋElsler Engineering Co., Inc., 740 S. 13th St., Newark 3, N. J.
ⓋHaydu Brothers, Plainfield, N. J.
ⓋKAHLE ENGINEERING CO., 1307 7th St., North Bergen, N. J. ADV. PG. 180, 181.
ⓋLitton Industries, San Carlos, Calif.

MACHINES—*Glass Working*

ⓋElsler Engineering Co., Inc., 740 S. 13th St., Newark 3, N. J.
Elm Laboratories, 18 South Broadway, Dobbs Ferry, N. Y.
ⓋHaydu Brothers, Plainfield, N. J.
ⓋKAHLE ENGINEERING CO., 1307 7th St., North Bergen, N. J. ADV. PG. 180, 181.
ⓋLitton Industries, San Carlos, Calif.
ⓋManufacturers Engr. & Equip. Corp., Willow Grove, Pa.
ⓋMICO INSTRUMENT CO., 80 Trowbridge St., Cambridge 38, Mass. ADV. PG. 263.

MACHINES—*Impregnating*

ⓋBarrett Co., Leon J., P. O. Box 378, Worcester 1, Mass.
ⓋBowser, Inc., Refrigeration Div., Terryville, Conn.
ⓋProduction Engineering Co., 173 Sanyeant Ave., Clifton, N. J.
ⓋStokes Machine Co., F. J., 5850 Tabor Rd., Olney P. O. Philadelphia 20, Pa.

MACHINES—*Instrument Shock Testing*

ⓋFerner Co., R. Y., 110 Pleasant St., Malden, Mass.
ⓋGadgets, Inc., 3269 N. Dixie Drive, Dayton 5, Ohio.
ⓋINSTRUMENT DEVELOPMENT LABORATORIES, INC., Needham Heights, Mass. ADV. PG. 243.

MACHINES—*Metal and Glass Marking*

ⓋAcromark Co., The, 422 Morrell St., Elizabeth 4, N. J.
Auto Engraver Co., Inc., 177a Broadway, New York, N. Y.
ⓋElsler Engineering Co., Inc., 740 S. 13th St., Newark 3, N. J.
ⓋHaydu Brothers, Plainfield, N. J.
ⓋIdeal Industries, Inc., Park & Borden Aves., Sycamore, Ill.
ⓋKAHLE ENGINEERING CO., 1307 7th St., North Bergen, N. J. ADV. PG. 180, 181.
ⓋLuma Electric Equipment Co., Box 132, Toledo 1, Ohio.
ⓋMarkem Machine Co., Keene, N. H.

MACHINES—*Photocopy*

ⓋALDEN PRODUCTS CO., 117 No. Main St., Brockton 64, Mass. ADV. PG. 235.
ⓋDietzgen Co., Eugene, 2425 Sheffield Ave., Chicago 14, Ill.
General Photo Products Co., Inc., 15 Summit Ave., Chatham, N. J.
ⓋHaloid Co., The, 6 Haloid St., Rochester, N. Y.
ⓋHunter Photo Copyist Co., 565 Spencer St., Syracuse, N. Y.
ⓋParagon Revolute Corp., 71 South Ave., Rochester 4, N. Y.
ⓋPease Co., C. F., 2601 W. Irving Park Rd., Chicago, Ill.
ⓋPeck & Harvey, 5736-38 N. Western Ave., Chicago 45, Ill.
ⓋPeerless Photo Products, Shoreham, L. I., N. Y.

MACHINES—*Record Manufacturing*

ⓋFairchild Recording Equipment Corp., 154th St. & 7th Avenue, Whitestone, N. Y.
ⓋPennetta Co., Inc., 96 Cedar Ave., Pitman, N. J.
ⓋStokes Machine Co., F. J., 5850 Tabor Rd., Olney P. O., Philadelphia 20, Pa.

MACHINES—*Tube Manufacturing*

ⓋBUCK ENGINEERING CO., INC., 37-41 Marcy St., Freehold, N. J. ADV. PG. 194.
ⓋDistillation Products Industries, Vacuum Equipment Div., 755 Ridge Rd. W., Rochester 3, N. Y.
Elm Laboratories, 18 South Broadway, Dobbs Ferry, N. Y.
ⓋHaydu Brothers, Plainfield, N. J.
ⓋInternational Machine Works, 6934 Madison St., Guttenberg, N. J.
ⓋKAHLE ENGINEERING CO., 1307 7th St., North Bergen, N. J. ADV. PG. 180, 181.
ⓋLitton Industries, San Carlos, Calif.
ⓋOptical Film Engineering Co., 2125 Cherry St., Philadelphia 3, Pa.
ⓋRADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.

MACHINES—*Vibration Fatigue Testing*

ⓋAll American Tool & Mfg. Co., 1014 W. Fullerton St., Chicago 14, Ill.
ⓋBaldwin Locomotive Works, Philadelphia 42, Pa.
ⓋCaldyne Co., The, 751 Main St., Winchester, Mass.
ⓋFerner Co., R. Y., 110 Pleasant St., Malden, Mass.
ⓋM-3 MFG. CO., 1060 State St., New Haven 11, Conn. ADV. PG. 249.
ⓋRAYTHEON MFG. CO., Power Tube Div., Waltham 54, Mass. ADV. PG. 257.
ⓋReid Co., 2070 N. Fair Oaks Ave., Pasadena 3, Calif.
ⓋWESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

MACHINES—*Whiteprint*

ⓋBruning Co., Inc., Charles, 4754 Montrose Ave., Chicago 41, Ill.
ⓋDietzgen Co., Eugene, 2425 Sheffield Ave., Chicago 14, Ill.
ⓋGraflex Div. of General Aniline & Film Corp., 770 Ansco Rd., Johnson City, N. Y.
ⓋParagon Revolute Corp., 71 South Ave., Rochester 4, N. Y.
ⓋPease Co., C. F., 2601 W. Irving Park Rd., Chicago, Ill.
ⓋPost Co., Frederick, 3650 N. Avondale Ave., Chicago 90, Ill.

MACHINES—*Wire Drawing*

ⓋElectric Auto-Lite Co., The, Toledo 1, Ohio.
ⓋKAHLE ENGINEERING CO., 1307 7th St., North Bergen, N. J. ADV. PG. 180, 181.

MACHINES—*Wire Stripping*

ⓋIdeal Industries, Inc., Park & Borden Avenues, Sycamore, Ill.

MAGNETIC ANALYSIS EQUIPMENT

ⓋAIRCRAFT ELECTRONICS ASSOCIATES, INC., 1031 New Britain Ave., Hartford 10, Conn. ADV. PG. 214.
ⓋFisher Scientific Co., 717 Forbes St., Pittsburgh 19, Pa.
ⓋLeeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
Magnetic Analysis Corp., 42-44 Twelfth St., Long Island City 1, N. Y.
ⓋRAWSON ELECTRICAL INSTRUMENT CO., 111 Potter St., Cambridge 42, Mass. ADV. PG. 156.

MAGNETIZERS AND DEMAGNETIZERS

ⓋAmpliher Corp. of America, 396 Broadway, New York 13, N. Y.
ⓋAnnis Co., R. B., 1101 N. Delaware St., Indianapolis, Ind.
Eastern Metals Industries, 250 W. 54th St., New York 19, N. Y.
Electric Heat Control Co., 9123 Inman Ave., Cleveland 5, Ohio.
ⓋHercules Electric & Mfg. Co., Inc., 2500 Atlantic Ave., Brooklyn 7, N. Y.
ⓋIdeal Industries, Inc., Park & Borden Aves., Sycamore, Ill.
ⓋLuma Electric Equipment Co., P. O. Box 132, Toledo 1, Ohio.
ⓋRADIO FREQUENCY LABS., INC., Boonton, 2, N. J. ADV. PG. 172.
ⓋRAYTHEON MFG. CO., Power Tube Div., Waltham 54, Mass. ADV. PG. 257.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Smith Mfg. Co., Nathan R., 130 Pasadena Ave., So. Pasadena, Calif.
Sperman Metal Specialties, 27 Columbia Place, Brooklyn 2, N. Y.

MAGNETOMETERS

ⓋGeophysical Instrument Co., 1820 N. Nash St., Arlington, Va.
ⓋHEILAND RESEARCH CORP., 130 E. 5th Ave., Denver 9, Colo. ADV. PG. 242.
ⓋRAWSON ELECTRICAL INSTRUMENT CO., 111 Potter St., Cambridge 42, Mass. ADV. PG. 156.
ⓋVarian Associates, 99 Washington St., San Carlos, Calif.

MAGNETRON

See Tubes

MAGNETS—*Permanent*

ⓋArnold Engineering Co., 147 E. Ontario St., Chicago, Ill.
ⓋCarboloy Company Inc., 11139 E. Eight Mile Blvd., Detroit 32, Mich.
ⓋCarman Mfg. Co., 215 S. Aberdeen St., Chicago, Ill.
ⓋCRUCIBLE STEEL CO. OF AMERICA, 405 Lexington Ave., New York 17, N. Y. ADV. PG. 179.
ⓋGeneral Magnetic Corp., 1001 Erwin Ave., Detroit 5, Mich.
ⓋINDIANA STEEL PRODUCTS COMPANY, THE, Valparaiso, Indiana. ADV. PG. 72.
ⓋMAGNETIC CORE CORP., 142-144 S. Highland Ave., Ossining, N. Y. ADV. PG. 274.
ⓋMagnetic Devices Corp., 103 S. Van Brunt Ave., Englewood, N. J.
ⓋMurex Ltd., Rainham, Essex, England.
Simmons Saw & Steel Co., Lockport, N. Y.
ⓋSTACKPOLE CARBON CO., St. Marys, Pa. ADV. PG. 166, 167.
ⓋThomas & Skinner Steel Products Co., 1120 E. 23rd St., Indianapolis, Ind.

MARKERS, WIRE

See Code and Tab Markers

MASKS—*Television*

Austin Co., Inc., O., 335 Throop Ave., Brooklyn 21, N. Y.
ⓋCroname, Inc., 3701 Ravenswood Ave., Chicago, Ill.
ⓋDietz Miracle Lens Co., 141 President St., Passaic, N. J.
Electrovox Co., Inc., 60 Franklin St., East Orange, N. J.
ⓋEtched Products Corp., 39-01 Queens Blvd., Long Island City, N. Y.
ⓋHaberland Mfg. Co., P. O. Box 476, Passaic, N. J.
ⓋPanoramic Novelty Co., 3510 So. Western Ave., Chicago 9, Ill.
ⓋPlastimold Corp., Attleboro, Mass.
ⓋPrecision Plastic Products Inc., 628-30 W. Lake St., Chicago 6, Ill.
ⓋTelectro Components, 141 Belleville Ave., Belleville, N. J.

MEGAPHONES—*Electronic*

ⓋAmerican Communications Corp., 304 Broadway, New York 7, N. Y.
ⓋAudio Equipment Co., 80-20 45th Ave., Elmhurst, N. Y.
ⓋRacon Electric Co., 52 E. 19th St., New York 3, N. Y.
Tayborn Equipment Co., Inc., 120 Greenwich St., New York 6, N. Y.
ⓋUNIVERSITY LOUDSPEAKERS, INC., 80 S. Kensico Ave., White Plains, N. Y. ADV. PG. 231.

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MEGOHMMETERS

Ⓥ Associated Research Inc., 3758 W. Belmont, Chicago 18, Ill.
Ⓥ Beta Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Communication Measurements Lab., 220 Greenwich St., New York, N. Y.
Electronic Brazing Co., 140 Uxbridge Ave., Montclair, N. J.
Ⓥ FREED TRANSFORMER CO., INC., 1716 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 193.
Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Ⓥ Industrial Instruments Inc., 17 Pollack Ave., Jersey City 5, N. J.
Maxfield & Hanspell, 10 Archer St., Charlestown 29, Mass.
Ⓥ MEASUREMENTS CORP., Boonton, N. J. ADV. Pg. 189.
Precision Apparatus Co., Inc., 24-34 Horace Harding Blvd., Elmhurst, N. Y.
Ⓥ RADIO FREQUENCY LABS., INC., Boonton 2, N. J. ADV. PG. 172.
Ⓥ RAWSON ELECTRICAL INSTRUMENT CO., 111 Potter St., Cambridge 42, Mass. ADV. PG. 156.
Sensitive Research Instrument Corp., 9 Elm Ave., Mt. Vernon, N. Y.
Ⓥ SHALLCROSS MFG. CO., 10 Jackson Ave., Collingdale, Pa. ADV. PG. 223.
Simpson Electric Co., Div. American Gage & Machine Co., 5200 W. Kinzie St., Chicago 44, Ill.
Strobe Co., Inc., Herman H., 27 Park Place, New York 7, N. Y.
Tech Laboratories, Inc., Bergen and Edsall Blvds., Palisades Park, N. J.

METAL CONES, TELEVISION

See Cones, Metal Television

METAL PARTS—*Bushings*

Ⓥ AEROLITE ELECTRONIC HARDWARE CORP., 507 26th St., Union City, N. J. ADV. PG. 138.
Ⓥ American Lubricator Corp., 333 W. 52nd St., New York 19, N. Y.
Ampere Electric, Chrysler Corp., Detroit 31, Mich.
Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Beach Precision Parts Co., Boonton, N. J.
Ⓥ Bound Brook Oil-Less Bearing Co., Bound Brook, N. J.
Ⓥ CAMBRIDGE THERMIONIC CORP., 445 Concord Ave., Cambridge, Mass. ADV. PG. 72.
Chase Brass & Copper Co., Inc., Waterbury 91, Conn.
Ⓥ Chatham Products Co., 233 E. 146th St., New York 51, N. Y.
Eastern Metals Industries, 250 W. 54th St., New York 19, N. Y.
Ⓥ Haydu Brothers, Plainfield, N. J.
Ⓥ Heli-Coil Corp., 47-23 35th St., Long Island City 1, N. Y.
Ⓥ Industrial Precision Products Co., 315-325 N. Hoyne Ave., Chicago 12, Ill.
Ⓥ KEYSTONE CARBON CO., INC., Saint Marys, Pa. ADV. PG. 43.
La Magna Mfg. Co., Inc., East Rutherford, N. J.
Ⓥ Molded Insulation Co., Aircraft Control Div., 335 E. Price St., Philadelphia, Pa.
Ⓥ NEWARK SPINNING & STAMPING CO., 471 Wilson St., Newark 5, N. J. ADV. PG. 269.
Nutmeg Mfg. Co., The, P. O. Box 1745, New Haven 7, Conn.
Ⓥ St. Marys Carbon Co., State Rd., St. Marys, Pa.
Ⓥ Smith, Inc., Herman H., 405 44th St., Brooklyn 32, N. Y.
Ⓥ Star Expansion Products Co., 147-149 Cedar St., New York 6, N. Y.
Ⓥ U. S. Graphite Co., Saginaw, Mich.

METAL PARTS—*Contacts*

See Contacts, Electrical

METAL PARTS—*Laminated*

Ⓥ Haydu Brothers, Plainfield, N. J.
Ⓥ Industrial Precision Products Co., 315-325 N. Hoyne Ave., Chicago 12, Ill.
Ⓥ MAKEPEACE CO., D. E., Attleboro, Mass. ADV. PG. 97.
Ⓥ Molded Insulation Co., Aircraft Control Div., 335 E. Price St., Philadelphia, Pa.
REF Mfg. Corp., Jericho Turnpike, Mineola, N. Y.
Ⓥ Smith, Inc., Herman H., 405 44th St., Brooklyn 32, N. Y.

METAL PARTS—*Lead*

Ⓥ Division Lead Co., 836 W. Kinzie St., Chicago 22, Ill.
Ⓥ Haydu Brothers, Plainfield, N. J.
Ⓥ National Lead Co., 111 Broadway, New York 6, N. Y.
Ⓥ Star Expansion Products Co., 147-149 Cedar St., New York 6, N. Y.
Ⓥ Vitamin Co., 227 W. 44th St., New York 23, N. Y.

METAL PARTS—*Powdered*

Ⓥ Amplex Division, Chrysler Corp., Detroit 31, Mich.
Ⓥ Bound Brook Oil-Less Bearing Co., Bound Brook, N. J.
Ⓥ KEYSTONE CARBON CO., INC., St. Marys, Pa. ADV. PG. 43.
North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
Ⓥ RADIO CORES, INC., 9540 Tilly Ave., Oak Lawn, Ill. ADV. PG. 260.
St. Marys Carbon Co., State Rd., St. Marys, Pa.
Ⓥ STACKPOLE CARBON CO., St. Marys, Pa. ADV. PG. 165, 167.
Ⓥ SYLVANIA ELECTRIC PRODUCTS, INC., Emporium, Pa. ADV. PG. 286 to 290.
U. S. Graphite Co., Saginaw, Mich.
Ⓥ Waterbury Companies, Inc., Waterbury 90, Conn.

METAL PARTS—*Screw Machine*

Ace Precision Products Corp., 10377 Vanowen St., Burbank, Calif.
Ⓥ Allmetal Screw Products Co., Inc., 33 Greene St., New York 13, N. Y.
American Lubricator Corp., 333 W. 52nd St., New York 19, N. Y.
Ⓥ ART-LLOYD METAL PRODUCTS CORP., 2973 Cropsey Ave., Brooklyn 14, N. Y. ADV. PG. 272.
Automatic Metal Products Co., 315 Barry St., Brooklyn 1, N. Y.
Ⓥ Autoscrew Co., 216-222 W. 18th St., New York, N. Y.
Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Beach Precision Parts Co., Boonton, N. J.
Ⓥ BIRD CO., Richard H., 1 Spruce St., Waltham, Mass. ADV. PG. 214.
Ⓥ BLAKE & JOHNSON CO., Waterville 46, Conn. ADV. PG. 225.
Ⓥ Buchmann Spark Wheel Corp., 4-20 47th Ave., Long Island City 1, N. Y.
Ⓥ CAMBRIDGE THERMIONIC CORP., 445 Concord Ave., Cambridge, Mass. ADV. PG. 72.
Chase Brass & Copper Co., Inc., Waterbury 91, Conn.
Ⓥ Chatham Products Co., 233 E. 146th St., New York 51, N. Y.
Ⓥ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ Corbin Screw Div., American Hardware Corp., High Mychie & Grove Sts., New Britain, Conn.
Ⓥ Diamond Mfg. Co., Wakefield, Mass.
Ⓥ Eastern Specialty Co., Philadelphia 40, Pa.
Ⓥ Engineering Co., 27 Wright St., Newark 11, N. J.
Ⓥ Erickson Screw Machine Products Co., 25 Lafayette St., Brooklyn 1, N. Y.
Ⓥ FEDERAL SCREW PRODUCTS, INC., 224 W. Huron St., Chicago 10, Ill. ADV. Pg. 271.
Ⓥ Hallett Mfg. Co., 1601 Florence Ave., Inglewood, Calif.
Ⓥ Haydu Brothers, Plainfield, N. J.
Ⓥ Hollo Bushing & Terminal Co., Inc., P. O. Box 91, Orange, N. J.
Ⓥ Heli-Coil Corp., 47-23 35th St., Long Island City 1, N. Y.
Ⓥ Industrial Precision Products Co., 315-325 N. Hoyne Ave., Chicago 12, Ill.
Ⓥ Instrument Parts Corp., P. O. 350, Deming, N. Y.
Ⓥ INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
Ⓥ Johnson Co., E. F., Waseca, Minn.
Ⓥ Kidd Co., H. T., 87 Chambers St., New York 7, N. Y.
Ⓥ Keystone Electronics Co., 49-52 Franklin St., New York 13, N. Y.
Ⓥ Kings Electronics Co., Inc., 811 Lexington Ave., Brooklyn 21, N. Y.
La Magna Mfg. Co., Inc., East Rutherford, N. J.
Ⓥ Lamson & Sessions Co., 1971 W. 85th St., Cleveland, Ohio.
Ⓥ Manufacturers Thread Grinding, Inc., P. O. Box 66, Watertown, N. Y.
Ⓥ Milford Rivet & Machine Co., Milford, Conn.
Ⓥ Molded Insulation Co., Aircraft Control Div., 335 E. Price St., Philadelphia, Pa.
Ⓥ National Screw & Mfg. Co., Cleveland 4, Ohio.
Ⓥ PRECISION METAL PRODUCTS CO. OF MALDEN, 342 Eastern Ave., Malden 48, Mass. ADV. Pg. 270.
Ⓥ Progressive Welder Co., 3050 E. Outer Drive, Detroit, Mich.
Ⓥ QUAKER CITY GEAR WORKS, 1908-52 N. Front St., Philadelphia 22, Pa. ADV. PG. 272.
Reiner Mfg. Co., Hagerstown, Md.
Ⓥ Renner Co., Ltd., 2101 Bryant St., San Francisco 10, Calif.
Ⓥ Scovill Mfg. Co., Industrial Fastener Div., Waterbury, Conn.
Sherpix Electronics Co., 1291 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ Smith, Inc., Herman H., 405 44th St., Brooklyn 32, N. Y.
Ⓥ Stimpson Co., Inc., Edwin B., 74 Franklin Ave., Brooklyn 5, N. Y.
Ⓥ SYLVANIA ELECTRIC PRODUCTS, INC., Emporium, Pa. ADV. PG. 286 to 290.
Ⓥ Thordarson Electric Mfg. Div., Maguire Industries, Inc., 500 W. Huron St., Chicago 10, Ill.
Titan Metal Mfg. Co., Bellefonte, Pa.
Ⓥ U. S. Engineering Co., 521 Commercial St., Glendale 3, Calif.
Ⓥ United Screw & Bolt Corp., 2513 W. Fullerton St., Chicago 8, Ill.
Ⓥ Vallorbe Jewel Co., Lancaster, Pa.
Waltham Screw Co., 77 Rumford Ave., Waltham, Mass.

METAL PARTS—*Small Metal Stampings*

Ⓥ ABALON PRECISION MFG. CORP., 540 Casanova St., Bronx 59, N. Y. ADV. PG. 266.
Acklin Stamping Co., 1923 Nebraska Ave., Toledo 7, Ohio.
Ⓥ AEROLITE ELECTRONIC HARDWARE CORP., 507 26th St., Union City, N. J. ADV. PG. 138.
Air-King Products Co., Inc., 170 53rd St., Brooklyn, N. Y.
Ⓥ ALDEN PRODUCTS CO., 117 No. Main St., Brockton 64, Mass. ADV. Pg. 235.
Ⓥ American Emblem Co., Inc., P. O. Box 116R, Utica, N. Y.
Ⓥ American Nut & Bolt Fastener Co., 2045 Doerr St., Pittsburgh 12, Pa.
Ⓥ ART-LLOYD METAL PRODUCTS CORP., 2973 Cropsey Ave., Brooklyn 14, N. Y. ADV. PG. 272.
Ⓥ ART WIRE & STAMPING CO., 227 High St., Newark 2, N. J. ADV. PG. 198.
Automatic Metal Products Co., 315 Barry St., Brooklyn 1, N. Y.
Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ Barnes-Gibson-Raymond Div. of Associated Spring Corp., 4400 Miller Ave., Detroit 11, Mich.
Carby Mfg. Co., Inc., 62 Cottage Place, Waterbury 5, Conn.
Ⓥ Chase Brass & Copper Co., Inc., Waterbury 91, Conn.
Ⓥ CINCH MFG. CORP., 1026 S. Homan Ave., Chicago 24, Ill. ADV. Pg. 154.
Ⓥ Citation Products Co., 233 E. 146th St., New York 51, N. Y.
Ⓥ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ Craft Mfg. Co., 3949 W. Schubert St., Chicago, Ill.
Ⓥ Cutler Metal Products Co., Camden, N. J.
Ⓥ Cuyahoga Spring Co., 10272 Berea Rd., Cleveland, Ohio.
Dante Electric Mfg. Co., Bantam, Conn.
Ⓥ Connelly Electric & Mfg. Co., 1050 Washington St., Boston, Mass.
Eastern Metals Industries, 250 W. 54th St., New York 19, N. Y.
Ⓥ Eastern Specialty Co., Philadelphia 40, Pa.
Elby, Inc., High H., 4700 Stenton Ave., Philadelphia 44, Pa.
Ⓥ Elco Mfg. Co. Div. of Electro-Connector Corp., 110 W. Oxford St., Philadelphia 22, Pa.
Ⓥ Electronic Mfg. Co., 25 Orange St., Newark, N. J.
Ⓥ Engineering Co., 27 Wright St., Newark, N. J.
Ⓥ Fabri-Tek Products Corp., 37-01 Queens Blvd., Long Island City, N. Y.
Ⓥ Franklin Mfg. Corp., A. W., 43-20 34th St., Long Island City, N. Y.
Ⓥ Flying Mfg. Co., 614 W. 12th St., Erie, Pa.
Ⓥ Garrett Co., Inc., George K., D and Tioga Sts., Philadelphia 34, Pa.
Ⓥ Gast Co., Inc., Fred, 314 Dean St., Brooklyn, N. Y.
Ⓥ Grammes & Sons, L. F., 389 Union St., Allentown 2, Pa.
Ⓥ Greene Mfg. Corp., G. G., Warren, Pa.
Ⓥ Gregory Mfg. Co., Inc., The, 67 Franklin St., New Haven 11, Conn.
Gothmann Inc., Edwin J., 15 S. Throop St., Chicago, Ill.
Ⓥ Hallett Mfg. Co., 1601 Florence Ave., Inglewood, Calif.
Ⓥ Haydu Brothers, Plainfield, N. J.
Ⓥ HEYMAN MFG. CO., 300 Michigan Ave., Kenilworth, N. J. ADV. Pg. 26.
Ⓥ Hubbard Spring Co., M. D., Central Ave., Pontiac, Mich.
Ⓥ Hunter Spring Co., Lansdale, Pa.

METAL PARTS—*Small Metal Stampings*

Ⓥ Industrial Precision Products Co., 315-325 N. Hoyne Ave., Chicago 12, Ill.
Ⓥ INSTRUMENT SPECIALTIES CO., INC., 254 Bergen Blvd., Little Falls, N. J. ADV. PG. 202.
Ⓥ INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
Ⓥ Johnson Co., E. F., Waseca, Minn.
Ⓥ Kidd Co., H. T., 87 Chambers St., New York 7, N. Y.
Ⓥ Keystone Electronics Co., 49-52 Franklin St., New York 13, N. Y.
Ⓥ King Laboratories, Inc., 127 Solar St., Syracuse 4, N. Y.
Ⓥ Kings Electronics Co., Inc., 811 Lexington Ave., Brooklyn 21, N. Y.
Ⓥ Kirk & Blum Mfg. Co., 2893 Spring Grove Ave., Cincinnati 25, Ohio.
King Metal Spinning Co., 174 Centre St., New York 13, N. Y.
Ⓥ Kulka Electric Mfg. Co., Inc., 30 South St., Mt. Vernon, N. Y.
La Magna Mfg. Co., Inc., East Rutherford, N. J.
Lansing Stamping Co., 1159 S. Pennsylvania Ave., Lansing, Mich.
Lenker Forge Co., Everett 49, Mass.
Ⓥ Mineralac Electric Co., 25 N. Peoria St., Chicago, Ill.
Ⓥ Minute Man Products, Inc., 309 E. 22nd St., New York 10, N. Y.

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Ⓥ Molded Insulation Co., Aircraft Control Div., 335 E. Price St., Philadelphia, Pa.
Ⓥ MULTI METAL WIRE CLOTH CO., INC., 1350 Garrison St., New York 59, N. Y. ADV. PG. xx.
Ⓥ NATIONAL CO., INC., 61 Sherman St., Malden 48, Mass. ADV. PG. 33 to 36.
Ⓥ National Gasket & Washer Mfg. Co., Inc., 124 E. 25th St., New York 10, N. Y.
Ⓥ National Screw & Mfg. Co., Cleveland 4, Ohio.
Ⓥ OLYMPIC METAL PRODUCTS CO., INC., Phillipsburg, N. J. ADV. PG. 148.
Ⓥ PATTON MacGUYER CO., 17 Virginia Ave., Providence 5, R. I. ADV. PG. 138.
Ⓥ Paul & Beekman Inc., 1801 Cortland St., Philadelphia 40, Pa.
Quadriga Mfg. Co., 213 W. Grand Ave., Chicago 11, Ill.
Ⓥ Raymond Mfg. Co., Div. of Associated Spring Corp., 226 S. Center St., Corry, Pa.
REF Mfg. Corp., Jericho Turnpike, Mineola, N. Y.
Ⓥ Repath Co., Paul R., 641 E. 61st St., Los Angeles 1, Calif.
Ⓥ Republic Steel Corp., Republic Bldg., Cleveland 1, Ohio.
Resner Mfg. Co., Hagerstown, Md.
Ⓥ Scovill Mfg. Co., Industrial Fastener Div., Waterbury, Conn.
Ⓥ Smith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.
Ⓥ Stanley Works, The, New Britain, Conn.
Ⓥ Star Expansion Products Co., 147-149 Cedar St., New York 6, N. Y.
Ⓥ STAVER CO., INC., 91 Pearl St., Brooklyn 1, N. Y. ADV. PG. 180.
Ⓥ Stimpson Co., Inc., Edwin, 74 Franklin Ave., Brooklyn 5, N. Y.
Ⓥ SYLVANIA ELECTRIC PRODUCTS, INC., Emporium, Pa. ADV. PG. 286 to 290.
Telner Engineering Corp., 115 Madison St., Malden 48, Mass.
Ⓥ Thordarson Electric Mfg. Div. Maguire Industries, Inc., 500 W. Huron St., Chicago 10, Ill.
Ⓥ Tinnerman Products Inc., 2038 Fulton Rd., Cleveland 13, Ohio.
Ⓥ Tinnerite Co., The, Div. of United-Carr Fastener Corp., 454 Watertown St., Newtonville, Mass.
Ⓥ United-Carr Fastener Corp., Cambridge 42, Mass.
Ⓥ United Screw & Bolt Corp., 2513 W. Cullerton St., Chicago 8, Ill.
Ⓥ United Shoe Machinery Corp., 142 Federal St., Boston, Mass.
Ⓥ Vallorbe Jewel Co., Lancaster, Pa.
Ⓥ VOLKERT METAL STAMPINGS INC., JOHN, 222-34 96th Ave., Queens Village, N. Y. ADV. PG. 63.
Ⓥ Walter Co., Inc., S., 1400 Atlantic Ave., Brooklyn 16, N. Y.
Ⓥ Waterbury Companies, Inc., Waterbury 90, Conn.
Ⓥ Whitehead Stamping Co., 1691 W. Lafayette Blvd., Detroit 16, Mich.
Ⓥ Wilson Co., The H. A., 105 Chestnut St., Newark 5, N. J.
Ⓥ Worcester Pressed Aluminum Corp., 13-15 Hope Ave., Worcester 3, Mass.
Ⓥ Wrought Washer Mfg. Co., 2264 S. Bay St., Milwaukee 7, Wis.
Zierick Mfg. Corp., Beechwood and Rockdale Aves., New Rochelle, N. Y.

METAL PARTS—*Spinnings*

Ⓥ Allmetal Spinning & Stamping Co., 1020 Willoughby Ave., Brooklyn, N. Y.
Ⓥ Electronic Mfg. Co., 20 Orange St., Newark, N. J.
Ⓥ Hillside Spinning & Stamping Co., Inc., 1429 Chestnut Ave., Hillside, N. J.
Ⓥ NEWARK SPINNING & STAMPING CO., 471 Bloy St., Hillside 5, N. J. ADV. PG. 269.
Schrader Co., J., 4603 Fenwick Ave., Cleveland, Ohio.

METAL PARTS—*Trimmings*

Ⓥ Arelin Stamping Co., 1921 Nebraska Ave., Toledo 7, Ohio.
Ⓥ Dixon Products Corp., 39-01 Queens Blvd., Long Island City, N. Y.
Eastern Metals Industries, 260 W. 54th St., New York 19, N. Y.
Ⓥ Emmanuel & Sons, L. F., 389 Union St., Allentown 2, Pa.
Ⓥ Industrial Precision Products Co., 315-325 N. Hoyne Ave., Chicago 12, Ill.
Ⓥ Kirk & Blum Mfg. Co., 2841 Spring Grove Ave., Cincinnati 25, Ohio.
REF Mfg. Corp., Jericho Turnpike, Mineola, N. Y.
Ⓥ SYLVANIA ELECTRIC PRODUCTS, INC., Emporium, Pa. ADV. PG. 286 to 290.
Ⓥ United-Carr Fastener Corp., Cambridge 42, Mass.
Ⓥ Waterbury Companies, Inc., Waterbury 90, Conn.

METALLIC PAINTS

See Paints

METALS

Aluminum

Ⓥ Aluminum Co. of America, Gulf Bldg., Pittsburgh, Pa.
Ⓥ Federated Metals Div., American Smelting & Refining Co., 120 Broadway, New York 5, N. Y.
Ⓥ Kaiser Aluminum & Chemical Sales, Inc., 1924 Broadway, Oakland 12, Calif.
Ⓥ North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
Ⓥ Revere Copper & Brass, Inc., 230 Park Ave., New York 17, N. Y.
Ⓥ Reynolds Metals Co., Market Research Dept., 19 E. 47th St., New York 17, N. Y.

Alnico

Ⓥ Arnold Engineering Co., 147 E. Ontario St., Chicago, Ill.
Ⓥ Carboloy Company, Inc., 11139 E. Eight Mile Blvd., Detroit 32, Mich.
Carron Mfg. Co., 215 S. Aberdeen St., Chicago, Ill.
Ⓥ INDIANA STEEL PRODUCTS COMPANY, THE, Valparaiso, Indiana. ADV. PG. 22.

Antimony

Ⓥ Division Lead Co., 836 W. Kinzie St., Chicago 22, Ill.
Ⓥ Federated Metals Div., American Smelting & Refining Co., 120 Broadway, New York 5, N. Y.
Ⓥ National Lead Co., 111 Broadway, New York 6, N. Y.

Arsenic

Ⓥ Federated Metals Div., American Smelting & Refining Co., 120 Broadway, New York 5, N. Y.

Barium

Ⓥ King Laboratories, Inc., 127 Solar St., Syracuse 4, N. Y.

Beryllium and Beryllium Alloys

Ⓥ Beryllium Corp., The, Reading, Pa.
Ⓥ Brush Beryllium Co., The, 4301 Perkins Ave., Cleveland 3, Ohio.
Ⓥ DRIVER CO., WILBUR B., 150 Riverside Ave., Newark 4, N. J. ADV. PG. 123.
Ⓥ GENERAL PLATE DIVISION, Metals & Controls Corp., Attleboro, Mass. ADV. PG. 245.
Ⓥ Mallory & Co., Inc., P. R., 3029 E. Washington St., Indianapolis 6, Ind.
Ⓥ Wilson Co., H. A., The, 105 Chestnut St., Newark 5, N. J.

Brass and Bronze

Ⓥ Bridgeport Brass Co., 30 Grand St., Bridgeport, Conn.
Ⓥ Chase Brass & Copper Co., Inc., Waterbury 91, Conn.
Ⓥ Federated Metals Div., American Smelting & Refining Co., 120 Broadway, New York 5, N. Y.
Ⓥ Mallory & Co., Inc., P. R., 3029 E. Washington St., Indianapolis 6, Ind.
Ⓥ Phosphor Bronze Corp., 20 Franklin St., Seymour, Conn.
Ⓥ Revere Copper & Brass, Inc., 230 Park Ave., New York 17, N. Y.
Titan Metal Mfg. Co., Bellefonte, Pa.

Cadmium

Ⓥ Division Lead Co., 836 W. Kinzie St., Chicago 22, Ill.
Ⓥ Federated Metals Div., American Smelting & Refining Co., 120 Broadway, New York 5, N. Y.
Ⓥ Mallory & Co., Inc., P. R., 3029 E. Washington St., Indianapolis 6, Ind.
Ⓥ Merck & Co., Inc., Rahway, N. J.

Cesium Compounds

(For Photo-tubes)

Ⓥ Dow Chemical Co., Midland, Mich.
Ⓥ King Laboratories, Inc., 127 Solar St., Syracuse 4, N. Y.

Chromium

Ⓥ Division Lead Co., 836 W. Kinzie St., Chicago 22, Ill.
Ⓥ Electro Metallurgical Division, Union Carbide and Carbon Corp., 30 E. 42nd St., New York 17, N. Y.

Coefficient Metals

Ⓥ Carpenter Steel Co., The, 142 W. Bern St., Reading, Pa.
Ⓥ COHN CORP., Sigmund, 44 Gold St., New York, N. Y. ADV. PG. 176.
Ⓥ DRIVER-HARRIS CO., 201 Middlesex St., Harrison, N. J. ADV. PG. 117.
Ⓥ GENERAL PLATE DIVISION, Metals & Controls Corp., Attleboro, Mass. ADV. PG. 245.
Ⓥ STUPAKOFF CERAMIC & MFG. CO., Latrobe, Pa. ADV. PG. 147.
Ⓥ Wilson Co., H. A., The, 105 Chestnut St., Newark 5, N. J.

Columbium

Ⓥ Electro Metallurgical Division, Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y.
Ⓥ Fansteel Metallurgical Corp., 2200 Sheridan Rd., North Chicago, Ill.
Metal Hyrides, Inc., Beverly, Mass.

Copper

Ⓥ Bridgeport Brass Co., 30 Grand St., Bridgeport, Conn.
Ⓥ Chase Brass & Copper Co., Inc., Waterbury 91, Conn.
Ⓥ Division Lead Co., 836 W. Kinzie St., Chicago 22, Ill.
Ⓥ Federated Metals Div., American Smelting & Refining Co., 120 Broadway, New York 5, N. Y.
Ⓥ Mallory & Co., Inc., P. R., 3029 E. Washington St., Indianapolis 6, Ind.
Ⓥ Revere Copper & Brass Inc., 230 Park Ave., New York 17, N. Y.

Electric Sheets

Ⓥ Allegheny Ludlum Steel Corp., H. W. Oliver Bldg., Pittsburgh 22, Pa.
Ⓥ Armco Steel Corp., 703 Curtis St., Middletown, Ohio.
Ⓥ Follansbee Steel Co., 3rd and Liberty Sts., Pittsburgh 30, Pa.
Ⓥ Mallory & Co., Inc., P. R., 3029 E. Washington St., Indianapolis 6, Ind.
Ⓥ Republic Steel Corp., Republic Bldg., Cleveland 1, Ohio.

Foil-Aluminum, Tin & Lead

Ⓥ Aluminum Co. of America, Gulf Bldg., Pittsburgh, Pa.
Ⓥ Bar-Ray Products, Inc., 209 25th St., Brooklyn 32, N. Y.
Ⓥ Federated Metals Div., American Smelting & Refining Co., 120 Broadway, New York 5, N. Y.
Ⓥ Johnston Foil Mfg. Co., 6100 S. Broadway St., Louis 11, Mo.
Ⓥ Kaiser Aluminum & Chemical Sales, Inc., 1924 Broadway, Oakland 12, Calif.
Ⓥ National Lead Co., 111 Broadway, New York 6, N. Y.
Ⓥ Reynolds Metals Co., Market Research Dept., 19 E. 47th St., New York 17, N. Y.

Gold and Gold Alloys

Ⓥ AMERICAN PLATINUM WORKS, N. J. R. R. Ave. at Oliver St., Newark 5, N. J. ADV. PG. 265.
Ⓥ Baker & Co., Inc., 113 Astor St., Newark 5, N. J.
Ⓥ BRAININ CO., C. S., 920 Washington St., Mt. Vernon, N. Y. ADV. PG. 234.
Ⓥ COHN CORP., SIGMUND, 44 Gold St., New York, N. Y. ADV. PG. 176.
Ⓥ Eastern Smelting & Refining Corp., 107-109 W. Brookline St., Boston 18, Mass.
Ⓥ GENERAL PLATE DIVISION, METALS & CONTROLS CORP., Attleboro, Mass. ADV. PG. 245.
Ⓥ Handy & Harman, 82 Fulton St., New York 7, N. Y.
Ⓥ Hoke Chemical Co., 29 E. Madison St., Chicago 2, Ill.
Ⓥ MAKEPEACE CO., D. E., Attleboro, Mass. ADV. PG. 97.
Ⓥ Mallory & Co., Inc., P. R., 3029 E. Washington St., Indianapolis 6, Ind.
Ⓥ NEY CO., J. M., 179 Elm St., Hartford, Conn. ADV. PG. 142.
Ⓥ Wildberg Bros. Smelting & Refining Co., 742 Market St., San Francisco 2, Calif.
Ⓥ Wilson Co., H. A., The, 105 Chestnut St., Newark 5, N. J.

High Permeability Alloys

Ⓥ Allegheny Ludlum Steel Corp., H. W. Oliver Bldg., Pittsburgh 22, Pa.
Ⓥ Allov Metal Wire Co., 13th and Penna Ave., Prospect Park, Pa.
Ⓥ Arnold Engineering Co., 147 E. Ontario St., Chicago 11, Ill.
Ⓥ Carpenter Steel Co., The, 142 W. Bern St., Reading, Pa.
Ⓥ DRIVER-HARRIS CO., 201 Middlesex St., Harrison, N. J. ADV. PG. 117.
Ⓥ Magnetic Metals Co., Hayes Ave. at 21st St., Camden, N. J.
Ⓥ Mallory & Co., Inc., P. R., 3029 E. Washington St., Indianapolis 6, Ind.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

Laminated Metal Parts

Ⓥ ART-LLOYD METAL PRODUCTS CORP., 2911 Cropsey Ave., Brooklyn, N. Y. ADV. PG. 272.
Ⓥ Eastern Smelting & Refining Corp., 107-109 W. Brookline St., Boston 18, Mass.
Ⓥ GENERAL PLATE DIVISION, Metals & Controls Corp., Attleboro, Mass. ADV. PG. 245.
Ⓥ MAKEPEACE CO., D. E., Attleboro, Mass. ADV. PG. 97.
Ⓥ Wilson Co., H. A., The, 105 Chestnut St., Newark 5, N. J.

(V) indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

Lead

(V) Bar-Ray Products, Inc., 209 23rd St., Brooklyn 32, N. Y.
(V) Division Lead Co., 836 W. Kinzie St., Chicago 22, Ill.
(V) Federated Metals Div., American Smelting & Refining Co., 120 Broadway, New York 5, N. Y.
(V) National Lead Co., 111 Broadway, New York 6, N. Y.
(V) Swanning Specialties Co., Saxonia, N. J.

Lithium Compounds (for cathode tube screen settling)

(V) Metal & Thermit Corp., Rahway, N. J.

Magnesium

(V) BURGESS BATTERY CO., Battery Div., Freeport, Ill. ADV. PG. 26
(V) Dow Chemical Co., Midland, Mich.
(V) Federated Metals Div., American Smelting & Refining Co., 120 Broadway, New York 5, N. Y.

Magnetic Iron Oxide (for cores)

(V) Mallory & Co., Inc., P. R., 3029 E. Washington St., Indianapolis 6, Ind.
(V) National Telephone & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.

METALS, MAGNETOSTRICTION

See NICKELS and NICKEL Alloys

Manganese

(V) Electro Metallurgical Division, Union Carbide and Carbon Corp., 30 E. 42nd St., New York 17, N. Y.
(V) Plastic Metals Division, The National Radiator Co., 169 Bridge Street, Johnstown, Pa.

Mercury

(V) Arthur Scientific Co., 1706 Irving Park Rd., Chicago 13, Ill.
(V) Division Lead Co., 836 W. Kinzie St., Chicago 22, Ill.
(V) Eastern Smelting & Refining Corp., 107-109 W. Brookline St., Boston 18, Mass.
(V) Merck & Co., Inc., Rahway, N. J.
(V) Wildberg Bros. Smelting & Refining Co., 742 Market St., San Francisco 2, Calif.

Molybdenum

(V) Cleveland Tungsten, Inc., 18000 Mercer Rd., Cleveland, Ohio
(V) CROSS CO., H., 15 Beekman St., New York 7, N. Y. ADV. PG. 308
(V) Fansteel Metallurgical Corp., 2200 Sheridan Rd., North Chicago, Ill.
(V) Metro Engineering Co., Inc., 940 S. 13th St., Newark 3, N. J.
(V) Metro Metallurgical Division, Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y.
(V) Metropolitan Metallurgical Corp., 3700 Sheridan Rd., North Chicago, Ill.
(V) Mallory & Co., Inc., P. R., 3029 E. Washington St., Indianapolis 6, Ind.
(V) Murex Ltd., Rainham, Essex, England
(V) North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
(V) WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 13

Monel

(V) Alloy Metal Wire Co., 100 S. Penn Ave., Prospect Park, Pa.
(V) DRIVER CO., WILBUR B., 140 Riverside Ave., Newark 4, N. J. ADV. PG. 123
(V) DRIVER-HARRIS CO., 202 Middlesex St., Harrison, N. J. ADV. PG. 117
(V) International Nickel Co., Inc., The, 67 Wall St., New York 5, N. Y.
(V) JELLIFF MFG. CORP., C. O., 200 Pequot Ave., Southport, Conn. ADV. PG. 86
(V) Magnetic Metals Co., Hayes Ave. at 21st St., Camden, N. J.
(V) Mallory & Co., Inc., P. R., 3029 E. Washington St., Indianapolis 6, Ind.
(V) Phosphor Bronze Corp., 20 Franklin St., Seymour, Conn.
(V) Plastic Metals Division, The National Radiator Co., 169 Bridge Street, Johnstown, Pa.
(V) Revere Copper & Brass, Inc., 230 Park Ave., New York 17, N. Y.
(V) Wilson Co., H. A., The, 105 Chestnut St., Newark 5, N. J.

Nickel Ribbon

(V) Alloy Metal Wire Co., 100 S. Penn Ave., Prospect Park, Pa.
(V) COHN CORP., SIGMUND, 44 Gold St., New York, N. Y. ADV. PG. 176
(V) DRIVER CO., WILBUR B., 140 Riverside Ave., Newark 4, N. J. ADV. PG. 123
(V) DRIVER-HARRIS CO., 202 Middlesex St., Harrison, N. J. ADV. PG. 117
(V) SYLVANIA ELECTRIC PRODUCTS, INC., Emporium, Pa. ADV. PG. 336 to 339

Palladium

(V) AMERICAN PLATINUM WORKS, N. J. R. R. Ave. at Oliver St., Newark 5, N. J. ADV. PG. 265
(V) Baker & Co., Inc., 113 Astor St., Newark 5, N. J.
(V) BRAININ CO., C. S., 520 Washington St., Mt. Vernon, N. Y. ADV. PG. 246
(V) COHN CORP., SIGMUND, 44 Gold St., New York, N. Y. ADV. PG. 176
(V) Eastern Smelting & Refining Corp., 107-109 W. Brookline St., Boston 18, Mass.
(V) GENERAL PLATE DIVISION, Metals & Controls Corp., Attleboro, Mass. ADV. PG. 245
(V) Handy & Harman, 82 Fulton St., New York 7, N. Y.
(V) MAKEPEACE CO., D. E., Attleboro, Mass. ADV. PG. 47
(V) Mallory & Co., Inc., P. R., 3029 E. Washington St., Indianapolis 6, Ind.
(V) NEY CO., J. M., 179 Elm St., Hartford, Conn. ADV. PG. 142
(V) Wildberg Bros. Smelting & Refining Co., 742 Market St., San Francisco 2, Calif.

Phosphor Bronze

(V) Bridgeport Brass Co., 30 Grand St., Bridgeport, Conn.
(V) Chase Brass & Copper Co., Inc., Waterbury 91, Conn.
(V) Federated Metals Div., American Smelting & Refining Co., 120 Broadway, New York 5, N. Y.
(V) KEYSTONE CARBON CO., INC., St. Marys, Pa. ADV. PG. 87
(V) Phosphor Bronze Corp., 20 Franklin St., Seymour, Conn.
(V) Revere Copper & Brass, Inc., 230 Park Ave., New York 17, N. Y.
(V) Wilson Co., H. A., The, 105 Chestnut St., Newark 5, N. J.

Platinum

(V) AMERICAN PLATINUM WORKS, N. J. R. R. Ave. at Oliver St., Newark 5, N. J. ADV. PG. 265
(V) Baker Co., Inc., 113 Astor St., Newark 5, N. J.
(V) BRAININ CO., C. S., 520 Washington St., Mt. Vernon, N. Y. ADV. PG. 246
(V) COHN CORP., SIGMUND, 44 Gold St., New York, N. Y. ADV. PG. 176
(V) Eastern Smelting & Refining Corp., 107-109 W. Brookline St., Boston 18, Mass.
(V) GENERAL PLATE DIVISION, Metals & Controls Corp., Attleboro, Mass. ADV. PG. 245
(V) Handy & Harman, 82 Fulton St., New York 7, N. Y.
(V) Mallory & Co., Inc., P. R., 3029 E. Washington St., Indianapolis 6, Ind.
(V) NEY CO., J. M., 179 Elm St., Hartford, Conn. ADV. PG. 142
(V) Wildberg Bros. Smelting & Refining Co., 742 Market St., San Francisco 2, Calif.

Powdered Metals

(V) Allegheny Ludlum Steel Corp., H. W. Oliver Bldg., Pittsburgh 22, Pa.
(V) ANTARA PRODUCTS, General Aniline & Film Corp., 444 Madison Ave., New York 22, N. Y. ADV. PG. 137
(V) Division Lead Co., 836 W. Kinzie St., Chicago 22, Ill.
(V) Fansteel Metallurgical Corp., 2200 Sheridan Rd., North Chicago, Ill.
(V) Handy & Harman, 82 Fulton St., New York 7, N. Y.
(V) INDIANA STEEL PRODUCTS COMPANY, THE, Valparaiso, Indiana. ADV. PG. 22
Metal Hydrides Inc., Beverly, Mass.
(V) National Lead Co., 111 Broadway, New York 6, N. Y.
(V) Plastic Metals Division, The National Radiator Co., 169 Bridge St., Johnstown, Pa.
(V) Standard Telephones & Cables, Ltd., Connaught House, Aldwych, London, W. C. 2, England.
(V) Wilson Co., H. A., The, 105 Chestnut St., Newark 5, N. J.

Silicon

(V) Allegheny Ludlum Steel Corp., H. W. Oliver Bldg., Pittsburgh 22, Pa.
(V) Electro Metallurgical Division, Union Carbide and Carbon Corp., 30 E. 42nd St., New York 17, N. Y.
(V) Mallory & Co., Inc., P. R., 3029 E. Washington St., Indianapolis 6, Ind.
(V) Plastic Metals Division, The National Radiator Co., 169 Bridge St., Johnstown, Pa.

Silver

(V) AMERICAN PLATINUM WORKS, N. J. R. R. Ave. at Oliver St., Newark 5, N. J. ADV. PG. 265
(V) Baker & Co., Inc., 113 Astor St., Newark 5, N. J.
(V) BRAININ CO., C. S., 520 Washington St., Mt. Vernon, N. Y. ADV. PG. 246
(V) Eastern Smelting & Refining Corp., 107-109 Brookline St., Boston 18, Mass.
(V) GENERAL PLATE DIVISION, Metals & Controls Corp., Attleboro, Mass. ADV. PG. 245
(V) Handy & Harman, 82 Fulton St., New York 7, N. Y.
(V) Kay Chemical Co., 79 E. Madison St., Chicago 2, Ill.
(V) MAKEPEACE CO., D. E., Attleboro, Mass. ADV. PG. 47
(V) Mallory & Co., Inc., P. R., 3029 E. Washington St., Indianapolis 6, Ind.
(V) Merck & Co., Inc., Rahway, N. J.
(V) NEY CO., J. M., 179 Elm St., Hartford, Conn. ADV. PG. 142
(V) North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
(V) Wildberg Bros. Smelting & Refining Co., 742 Market St., San Francisco 2, Calif.
(V) Wilson Co., H. A., The, 105 Chestnut St., Newark 5, N. J.

Silver Alloys and Compounds

(V) Baker & Co., Inc., 113 Astor St., Newark 5, N. J.
(V) Division Lead Co., 836 W. Kinzie St., Chicago 22, Ill.
(V) Eastern Smelting & Refining Corp., 107-109 W. Brookline St., Boston 18, Mass.
(V) Fansteel Metallurgical Corp., 2200 Sheridan Rd., North Chicago, Ill.
(V) GENERAL PLATE DIVISION, Metals & Controls Corp., Attleboro, Mass. ADV. PG. 245
(V) Handy & Harman, 82 Fulton St., New York 7, N. Y.
(V) MAKEPEACE CO., D. E., Attleboro, Mass. ADV. PG. 47
(V) Mallinckrodt Chemical Works, Second and Mallinckrodt Sts., St. Louis 7, Mo.
(V) Mallory & Co., Inc., P. R., 3029 E. Washington St., Indianapolis 6, Ind.
(V) NEY CO., J. M., 179 Elm St., Hartford, Conn. ADV. PG. 142
(V) Revere Copper & Brass, Inc., 230 Park Ave., New York 17, N. Y.
(V) Wildberg Bros. Smelting & Refining Co., 742 Market St., San Francisco 2, Calif.
(V) Wilson Co., H. A., The, 105 Chestnut St., Newark 5, N. J.

Steel

(V) Allegheny Ludlum Steel Corp., H. W. Oliver Bldg., Pittsburgh 22, Pa.
(V) American Steel & Wire Co., U. S. Steel Corp. Sub., Rockefeller Bldg., Cleveland 13, Ohio
(V) Armco Steel Corp., 703 Curtis St., Middletown, Ohio
(V) Carnegie-Illinois Steel Corp., U. S. Steel Corp., Sub., Carnegie Bldg., Pittsburgh, Pa.
(V) CRUCIBLE STEEL CO. OF AMERICA, 405 Lexington Ave., New York 17, N. Y. ADV. PG. 179
(V) Lukens Steel Co. and Division, By-Products Steel Co. & Lukenweld, 437 Lukens Bldg., Coatesville, Pa.
(V) Plastic Metals Division, The National Radiator Co., 169 Bridge St., Johnstown, Pa.
(V) Republic Steel Corp., Republic Bldg., Cleveland 1, Ohio
(V) Timken & Co., Inc., J. T., Box 6000 A, Chicago 80, Ill.
(V) Tubemakers of America, Inc., Div., Columbia Steel & Shafting Co., P. O. Box 1557, Pittsburgh 30, Pa.
Timken Roller Bearing Co., Canton 6, Ohio
(V) Wickwire Spencer Steel Div., The Colorado Fuel and Iron Corp., 500 Fifth Ave., New York 18, N. Y.

Steel, Electrical

(V) Allegheny Ludlum Steel Corp., H. W. Oliver Bldg., Pittsburgh 22, Pa.
(V) Armco Steel Corp., 703 Curtis St., Middletown, Ohio
(V) Carnegie-Illinois Steel Corp., U. S. Steel Corp., Sub., Carnegie Bldg., Pittsburgh, Pa.
(V) DRIVER CO., WILBUR B., 140 Riverside Ave., Newark 4, N. J. ADV. PG. 123

V indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

V Follansbee Steel Co., Pittsburgh 30, Pa.
V Republic Steel Corp., Republic Bldg., Cleveland 1, Ohio.

Steel, Stainless

V Allegheny Ludlum Steel Corp., H. K. Porter Bldg., Pittsburgh 22, Pa.
V Alloy Metal Wire Co., 11th and Pennsylvania Ave., Prospect Park, Pa.
V Armco Steel Corp., 703 Curtis St., Middletown, Ohio.
V Carnegie-Illinois Steel Corp., U. S. Steel Corp., Sub., Carnegie Building, Pittsburgh, Pa.
V Carpenter Steel Co., The, 142 W. Bern St., Reading, Pa.
V CRUCIBLE STEEL CO. OF AMERICA, 405 Lexington Ave., New York 17, N. Y. ADV. PG. 179.
V DRIVER CO., WILBUR B., 150 Riverside Ave., Newark 4, N. J. ADV. PG. 123.
V DRIVER-HARRIS CO., 281 Middlesex St., Harrison, N. J. ADV. PG. 17.
V KEYSTONE CARBON CO., INC., St. Marys, Pa. ADV. PG. 42.
V Lukens Steel Co. & Divisions: By-Products Steel Co. & Lukenweld, 447 Lukens Bldg., Coatesville, Pa.
V Republic Steel Corp., Republic Bldg., Cleveland 1, Ohio.
V Ryerson & Son, Inc., J. T., Box 8000-A, Chicago, Ill.
V Summerill Tubing Co., Div., Colombia Steel & Shafting Co., P. O. Box 1557, Pittsburgh 30, Pa.

Strontium

V Eastern Smelting & Refining Corp., 107-109 W. Broadway St., Boston 18, Mass.
V King Laboratories, Inc., 127 Silar St., Syracuse 4, N. Y.

Tantalum

V CROSS CO., H., 15 Beekman St., New York, N. Y. ADV. PG. 208.
V Eastern Smelting & Refining Corp., 107-109 W. Broadway St., Boston 18, Mass.
V Fansteel Metallurgical Corp., 2200 Sheridan Rd., North Chicago, Ill.
Metal Hydrides, Inc., Beverly, Mass.

Thermostatic Bi-Metals

V Chace Co., W. M., 1600 Beard Ave., Detroit, Mich.
V GENERAL PLATE DIVISION, Metals & Controls Corp., Attleboro, Mass. ADV. PG. 245.
V Wilson Co., H. A., The, 105 Chestnut St., Newark 5, N. J.

Tin

V Division Lead Co., 836 W. Kinzie St., Chicago 22, Ill.
V Federated Metals Div., American Smelting & Refining Co., 120 Broadway, New York 5, N. Y.
V GLASER LEAD CO., INC., 31 Wyckoff Ave., Brooklyn, N. Y. ADV. PG. 251.
V Merck & Co., Inc., Rahway, N. J.
V National Lead Co., 111 Broadway, New York 6, N. Y.

Tungsten

V Cleveland Tungsten, Inc., 16600 Mesnh Ave., Cleveland, Ohio.
V Exeter Engineering Co., Inc., 740 S. 13th St., Newark 3, N. J.
V Electro Metallurgical Division, Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y.
V Fansteel Metallurgical Corp., 2200 Sheridan Rd., North Chicago, Ill.
V Mallory & Co., Inc., P. R., 3029 E. Washington St., Indianapolis 6, Ind.
Metal Hydrides, Inc., Beverly, Mass.
V North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
V SYLVANIA ELECTRIC PRODUCTS, INC., Emporium, Pa. ADV. PG. 238 to 240.
V WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
V Wilson Co., H. A., The, 105 Chestnut St., Newark 5, N. J.

Tungsten Ribbon

V CROSS CO., H., 15 Beekman St., New York 5, N. Y. ADV. PG. 208.
V North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
V SYLVANIA ELECTRIC PRODUCTS, INC., Emporium, Pa. ADV. PG. 238 to 240.
V WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

Zinc

V Division Lead Co., 836 W. Kinzie St., Chicago 22, Ill.
V Federated Metals Div., American Smelting & Refining Co., 120 Broadway, New York 5, N. Y.
V GLASER LEAD CO., INC., 31 Wyckoff Ave., Brooklyn, N. Y. ADV. PG. 251.
Merck & Co., Inc., Rahway, N. J.
V National Lead Co., 111 Broadway, New York 6, N. Y.
V New Jersey Zinc Co., 160 Front St., New York 7, N. Y.

Zirconium

V Electro Metallurgical Division, Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y.
V Foote Mineral Co., 18 W. Chelten Ave., Philadelphia 44, Pa.
V Mallory & Co., Inc., P. R., 3029 E. Washington St., Indianapolis 6, Ind.
Metal Hydrides, Inc., Beverly, Mass.
V WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

METEOROLOGICAL EQUIPMENT—*Electronic*

V Aeronautical Communications Equipment, Inc., 1092 Douglas Rd., Miami 33, Fla.
Applied Science Corp. of Princeton, The, P. O. Box 44, Princeton, N. J.
V BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Davies Laboratories, Inc., 4709 Queensbury Rd., Riverdale, Md.
V Hastings Instrument Co., Box 1275, Hampton, Va.
V McElroy Mfg. Corp., Littleton, Mass.
Molded Insulation Co., Aircraft Control Div., 335 E. Price St., Philadelphia, Pa.
Serdex, Inc., 91 Cambridge St., Boston, Mass.

METERS, Acceleration

See Accelerometers

METERS—*Attenuation*

American Electroneering Co., 2112 S. LaBrea Ave., Los Angeles, Calif.
V CINEMA ENGINEERING CO., 1510 W. Verdugo Ave., Burbank, Calif. ADV. PG. 186.
V Cole Instrument Co., 1320 Grand Ave., Los Angeles 15, Calif.
V Daven Co., 191 Central Ave., Newark 4, N. J.
V Fairchild Recording Equipment Corp., 154th St. & 7th Avenue, Whitestone, N. Y.
V HEWLETT-PACKARD CO., 395 Page Mill Rd., Palo Alto, Calif. ADV. PG. 68, 69.
V Kellogg Switchboard & Supply Co., 6650 S. Cicero Ave., Chicago 38, Ill.
V Simpson Electric Co., Div. of American Gage & Machine Co., 5208 W. Kinzie St., Chicago 44, Ill.
V SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.
V Tech Laboratories, Inc., Bergen & Edsall Blvds., Palisades Park, N. J.

METERS—*Cable Testing*

V Associated Research, Inc., 6758 W. Belmont, Chicago 18, Ill.
V Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
V Deutschmann Corp., Tobe, 921 Providence Highway, Norwood, Mass.
V Dillon & Co., Inc., W. C., 5410 W. Harrison St., Chicago 44, Ill.
Electronic Brazing Co., 140 Glenside Ave., Montclair, N. J.
V Kellogg Switchboard & Supply Co., 6650 S. Cicero Ave., Chicago 38, Ill.
V Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
V SHALLCROSS MFG. CO., 10 Jackson Ave., Collingdale, Pa. ADV. PG. 221.
V Southwestern Industrial Electronic Co., 2831 Post Oak Rd., Houston 19, Texas.

METERS—*Counting Rate*

V Anton Electronic Laboratories, Inc., 1226-1238 Flushing Ave., Brooklyn 6, N. Y.
V Berkeley Scientific Co., Richmond, Calif.
V Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Electronic Products Co., 111 E. 3rd St., Mt. Vernon, N. Y.
V GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
V Geophysical Instrument Co., 1820 N. Nash St., Arlington, Va.
V Garrett & Gorrell, Haworth, N. J.
V Manufacturers Engr. & Equip. Corp., Willow Grove, Pa.
V Nuclear Instrument & Chemical Co., 223 W. Erie St., Chicago 10, Ill.
V Nucleonic Corp. of America, The, 497 Union St., Brooklyn 31, N. Y.
V Radiation Counter Laboratories, Inc., 1844 W. 21st St., Chicago 8, Ill.
V Special Instruments Laboratory, Inc., 1001 Highland Ave., Knoxville, Tenn.
V Tracerlab Inc., 130 High St., Boston 10, Mass.

METERS—*d'Arsonval*

See Also Galvanometers

V Assembly Products, Inc., Chagrin Falls 6, Ohio.
V Associated Research, Inc., 3758 W. Belmont, Chicago 18, Ill.
V Beede Electrical Instrument Co., Inc., Penacook, N. H.
V Burlington Instrument Co., Burlington, Iowa.
V Central Scientific Co., 1700 Irving Park Rd., Chicago 13, Ill.
V Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Electric Design & Mfg. Corp., Burlington, Iowa.
V Esterline-Angus Co., Inc., P. O. Box 596, Indianapolis 6, Ind.
V GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
V HICKOK ELECTRICAL INSTRUMENT CO., 10514 Dupont Ave., Cleveland, Ohio. ADV. PG. 215.
V International Instruments, Inc., 331 East St., New Haven 11, Conn.
V MARION ELECTRICAL INSTRUMENT CO., Manchester, N. H. ADV. PG. 130.
V Meters, Inc., 915 Westfield Blvd., Indianapolis 20, Ind.
V RAWSON ELECTRICAL INSTRUMENT CO., 111 Potter St., Cambridge 42, Mass. ADV. PG. 156.
V Reliance Electric Instrument Co., 3027 Van Buren St., Chicago 12, Ill.
V Sensitive Research Instrument Corp., 9 Elm Ave., Mt. Vernon, N. Y.
V Simpson Electric Co., Div. of American Gage & Machine Co., 5208 W. Kinzie St., Chicago 44, Ill.
V Supreme, Inc., Greenwood, Miss.
V Triplett Electrical Instrument Co., 286 Harmon Rd., Bluffton, Ohio.
V WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

METERS—*Decibel*

V Burlington Instrument Co., Burlington, Iowa.
V Clough-Brengle Co., 6014 N. Broadway, Chicago, Ill.
V Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
V Connecticut Telephone & Electric Div., Great American Industries, Inc., 70 Britannia St., Meriden, Conn.
V Daven Co., 191 Central Ave., Newark 4, N. J.
Electric Design & Mfg. Corp., Burlington, Iowa.
V ELECTRONIC INSTRUMENT CO., INC., 276 Newport St., Brooklyn 12, N. Y. ADV. PG. 274.
V Fairchild Recording Equipment Corp., 154th St. & 7th Ave., Whitestone, N. Y.
V GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
V HEWLETT-PACKARD CO., 395 Page Mill Rd., Palo Alto, Calif. ADV. PG. 68, 69.
V HICKOK ELECTRICAL INSTRUMENT CO., 10514 Dupont Ave., Cleveland, Ohio. ADV. PG. 215.
V International Instruments, Inc., 331 East St., New Haven 11, Conn.
McMurdo Silver Co., Inc., 1240 Main St., Hartford 3, Conn.
V Marion Instruments, Ltd., 23 Beaver St., New York 4, N. Y.
V Meters, Inc., 915 Westfield Blvd., Indianapolis 20, Ind.
V Scott, Inc., Herman Hosmer, 385 Putnam Ave., Cambridge 39, Mass.
V SHALLCROSS MFG. CO., 10 Jackson Ave., Collingdale, Pa. ADV. PG. 221.
Sierra Electronic Corp., San Carlos, Calif.
V Simpson Electric Co., Div. of American Gage & Machine Co., 5208 W. Kinzie St., Chicago 44, Ill.
V Triplett Electrical Instrument Co., 286 Harmon Rd., Bluffton, Ohio.
V WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

METERS—*Distortion and Noise*

V Audio Instrument Co., 1947 Broadway, New York 23, N. Y.
V BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
V C. G. S. LABORATORIES, INC., 36 Ludlow St., Stamford, Conn. ADV. PG. 244.
V Daven Co., 191 Central Ave., Newark 4, N. J.
V Doolittle Radio, Inc., 7421 S. Loomis Blvd., Chicago 36, Ill.
V ELECTRONIC MEASUREMENTS CO., Red Bank, N. J. ADV. PG. 139.
V FREED TRANSFORMER CO., INC., 1716 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 143.
V GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
V HEWLETT-PACKARD CO., 395 Page Mill Rd., Palo Alto, Calif. ADV. PG. 68, 69.
V KAY ELECTRIC CO., 14 Maple Ave., Pine Brook, N. J. ADV. PG. 193.
V Marion Instruments, Ltd., 23 Beaver St., New York 4, N. Y.
V PANORAMIC RADIO PRODUCTS, INC., 10 South Second Ave., Mt. Vernon, N. Y. ADV. PG. 270.

METERS—*Elapsed Time*

V AMERICAN CHRONOSCOPE CORP., 316 W. First St., Mt. Vernon, N. Y. ADV. PG. 84.
V Berkeley Scientific Co., Richmond, Calif.

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

Ⓥ Burlington Instrument Co., Burlington, Iowa.
Ⓥ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ CRAMER CO., INC., R. W., Box 13, Centerbrook, Conn. ADV. PG. 208.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Gurrell & Gurrell, Haworth, N. J.
Harshaw Scientific Div. of The Harshaw Chemical Co., 1945 E. 97th St., Cleveland 6, Ohio.
Ⓥ HAYDON MFG. CO., INC., 584 E. Elm St., Torrington, Conn. ADV. PG. 102, 103.
Ⓥ Industrial Timer Corp., 115 Edison Pl., Newark 5, N. J.
Ⓥ J. B. T. INSTRUMENTS, INC., 441 Chapel St., New Haven 8, Conn. ADV. PG. 261.
Ⓥ Manufacturers Engr. & Equip. Corp., Willow Grove, Pa.
Ⓥ Marconi Instruments, Ltd., 23 Beaver St., New York 4, N. Y.
Ⓥ MARION ELECTRICAL INSTRUMENT CO., Manchester, N. H. ADV. PG. 135.
Ⓥ RAYSON ELECTRICAL INSTRUMENT CO., 111 Putter St., Canton-Sge 42, Mass. ADV. PG. 156.
Ⓥ Sheffield Instrument Corp., 2021 N. Lincoln St., Burbank, Calif.
Ⓥ Simpson Electric Co., Div. of American Gage & Machine Co., 5208 W. Kinzie St., Chicago 44, Ill.
Ⓥ Special Instruments Laboratory, Inc., 1001 Highland Ave., Knoxville, Tenn.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

METERS—*Electronic Capacitance*

Ⓥ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Ⓥ HICKOK ELECTRICAL INSTRUMENT CO., 10514 Dupont Ave., Cleveland, Ohio. ADV. PG. 215.
Ⓥ Kaithley Labs., Inc., 1026 Morena Blvd., San Diego 10, Calif.
Maitland & Hamlpot, 10 Joiner St., Charlestown 29, Mass.
McMurdo Silver Co., Inc., 1240 Main St., Hartford 3, Conn.
Ⓥ Marconi Instruments, Ltd., 23 Beaver St., New York 4, N. Y.
Shott Wave Plastic Forming Co., 2921 W. Almeda St., Burbank, Calif.

METERS—*Field Intensity*

American Electroneering Co., 2112 S. LaBrea Ave., Los Angeles, Calif.
Ⓥ Clarke Instrument Corp., 910 King St., Silver Spring, Md.
Ⓥ ELECTRONIC INSTRUMENT CO., INC., 276 Newport St., Brooklyn 12, N. Y. ADV. PG. 274.
Ⓥ FEDERAL TELEPHONE AND RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ KAY ELECTRIC CO., 14 Maple Ave., Pine Brook, N. J. ADV. PG. 193.
Ⓥ Marconi Instruments, Ltd., 23 Beaver St., New York 4, N. Y.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
Ⓥ SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.
Ⓥ STODDARD AIRCRAFT RADIO CO., 6644 Santa Monica Blvd., Hollywood 38, Calif. ADV. PG. 158.

METERS—*Field Strength*

American Electroneering Co., 2112 S. La Brea Ave., Los Angeles, Calif.
Approved Electronic Instrument Corp., 142 Liberty St., New York 6, N. Y.
Ⓥ Clarke Instrument Corp., 910 King St., Silver Spring, Md.
Ⓥ ELECTRONIC INSTRUMENT CO., INC., 276 Newport St., Brooklyn 12, N. Y. ADV. PG. 274.
Ⓥ FEDERAL TELEPHONE & RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.
Ⓥ FLADER, INC., FREDERIC, North Tonawanda, N. Y. ADV. PG. 157.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ KAY ELECTRIC CO., 14 Maple Ave., Pine Brook, N. J. ADV. PG. 193.
Ⓥ Kenner Engineers, Inc., 1721 Delaney St., Philadelphia 3, Pa.
Ⓥ Marconi Instruments, Ltd., 23 Beaver St., New York 4, N. Y.
Ⓥ MEASUREMENTS CORP., Boonton, N. J. ADV. PG. 141.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
Ⓥ Radio Transmitter Labs., 13-23 Jamaica Ave., Richmond Hill 18, N. Y.
Ⓥ Raytheon, Inc., 460 North Ave., New Rochelle, N. Y.

METERS—*f-m Deviation*

See Also Monitors.

Ⓥ BROWNING LABORATORIES, INC., 750 Main St., Winchester, Mass. ADV. PG. 30.
Ⓥ Doolittle Radio, Inc., 7421 S. Loomis Blvd., Chicago 36, Ill.
Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Ⓥ Marconi Instruments, Ltd., 23 Beaver St., New York 4, N. Y.
Monitor Products Co., 915 Fremont Ave., So. Pasadena, Calif.
Ⓥ REEVES-HOFFMAN CORP., 321 Cherry St., Carlisle, Pa. ADV. PG. 32.

METERS—*Flow*

Ⓥ Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.
Ⓥ Bailey Meter Co., 1044 Ivanhoe Rd., Cleveland 10, Ohio.
Ⓥ ECLIPSE-PIONEER DIV., Bendix Aviation Corp., Teterboro, N. J. ADV. PG. 176.
Ⓥ Fischer & Porter Co., Hatboro, Pa.
Ⓥ Hastings Instrument Co., Box 1275, Hampton, Va.
Ⓥ Minneapolis Honeywell Regulator Co., Industrial Div., Wayne & Roberts Aves., Philadelphia 44, Pa.
Ⓥ U. S. Gauge Div., American Machine & Metals, Inc., Sellersville, Pa.

METERS—*Flutter*

See Meters, Wow and Flutter

METERS—*Footcandle*

Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Ⓥ MARION ELECTRICAL INSTRUMENT CO., Manchester, N. H. ADV. PG. 135.
Photovolt Corp., 95 Madison Ave., New York 16, N. Y.

METERS—*Frequency*

American Electroneering Co., 2112 S. LaBrea Ave., Los Angeles, Calif.
Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ Berkeley Scientific Co., Richmond, Calif.
Ⓥ Biddle Co., James G., 1316 Arch St., Philadelphia 7, Pa.
Ⓥ BROWNING LABORATORIES, INC., 750 Main St., Winchester, Mass. ADV. PG. 30.
Burnett Radio Lab., Wm. W. L., 4814 Idaho St., San Diego, Calif.
Ⓥ CLARK CRYSTAL CO., 2 Farm Rd., Marlboro, Mass. ADV. PG. 213.
Ⓥ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ Daven Co., 191 Central Ave., Newark 4, N. J.
Ⓥ Doolittle Radio, Inc., 7421 S. Loomis Blvd., Chicago 36, Ill.
Esles Mfg. Co., Inc., 528 E. 72nd St., New York, N. Y.
Ⓥ Esterline-Angus Co., Inc., P. O. Box 596, Indianapolis 6, Ind.
Ⓥ FREED TRANSFORMER CO., INC., 1736 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 145.
Ⓥ Hurst Electronics, 128 E. Jefferson St., Chicago 6, Ill.
Ⓥ Kurtz Radio Co., Quincy, Ill.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Ⓥ Gertsch Products, Inc., 11846 Mississippi Ave., Los Angeles 25, Calif.
Ⓥ HEWLETT-PACKARD CO., 395 Page Mill Rd., Palo Alto, Calif. ADV. PG. 68 to 71.
Ⓥ HICKOK ELECTRICAL INSTRUMENT CO., 10514 Dupont Ave., Cleveland, Ohio. ADV. PG. 215.
Ⓥ J. B. T. INSTRUMENTS, INC., 441 Chapel St., New Haven 8, Conn. ADV. PG. 261.
Ⓥ KAY ELECTRIC CO., 14 Maple Ave., Pine Brook, N. J. ADV. PG. 193.
Ⓥ Kessler Switchboard & Supply Co., 6650 S. Cicero Ave., Chicago 38, Ill.
Ⓥ LAMPKIN LABORATORIES, INC., Bradenton, Fla. ADV. PG. 216.
Ⓥ LAVOIE LABORATORIES, Morganville, N. J. ADV. PG. 155.
Ⓥ Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
Local Electronics Corp., 794 E. 140th St., New York 54, N. Y.
Ⓥ Marconi Instruments, Ltd., 23 Beaver St., New York 4, N. Y.
Ⓥ Miller Mfg. Co., James, 555 Eastman St., Malden, Mass.
Monitor Products Co., 915 Fremont Ave., So. Pasadena, Calif.
Ⓥ POTTER INSTRUMENT CO., INC., 115 Cutter Mill Rd., Great Neck, N. Y. ADV. PG. 206.
Ⓥ REEVES-HOFFMAN CORP., 321 Cherry St., Carlisle, Pa. ADV. PG. 32.
Ⓥ Roller-Smith, Bethlehem, Pa.
Ⓥ Sheffield Instrument Corp., 2021 N. Lincoln St., Burbank, Calif.
Sierra Electronic Corp., San Carlos, Calif.
Ⓥ Simpson Electric Co., Div. of American Gage & Machine Co., 5208 W. Kinzie St., Chicago 44, Ill.
Ⓥ SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.
Ⓥ Triplett Electrical Instrument Co., 286 Harmon Rd., Bluffton, Ohio.
Ⓥ Varian Associates, 99 Washington St., San Carlos, Calif.
Ⓥ Varo Mfg. Co., Inc., Box 638, Garland, Texas.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

METERS—*Hearing Aid*

Ⓥ DEJUR-AMSCO CORP., Northern Blvd., at 45th St., Long Island City 1, N. Y. ADV. PG. 267.
Electro-Mechanical Instrument Co., 812 Chestnut St., Perkasie, Pa.
Ⓥ International Instruments, Inc., 331 East St., New Haven 11, Conn.
Ⓥ J. B. T. INSTRUMENTS, INC., 441 Chapel St., New Haven 8, Conn. ADV. PG. 261.
Ⓥ SHURITE METERS, 61 Hamilton St., New Haven 8, Conn. ADV. PG. 216.
Ⓥ Sterling Mfg. Co., 9205 Detroit Ave., Cleveland 2, Ohio.
Ⓥ Tech Laboratories, Inc., Bergen & Edsall Blvds., Palisades Park, N. J.

METERS—*Impedance*

Ⓥ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ Electrodyne Company, 32 Oliver St., Boston, Mass.
Ⓥ FREED TRANSFORMER CO., INC., 1736 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 145.
Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Ⓥ JONES ELECTRONICS CO., M. C., Bristol, Conn. ADV. PG. 138.
Ⓥ Marconi Instruments, Ltd., 23 Beaver St., New York 4, N. Y.
Ⓥ POLYTECHNIC RESEARCH & DEVELOPMENT CO., INC., 202 Tillary St., Brooklyn 1, N. Y. ADV. PG. 56, 57.
Ⓥ Rollin Co., 2070 N. Fair Oaks Ave., Pasadena 3, Calif.
Shott Wave Plastic Forming Co., 2921 W. Almeda St., Burbank, Calif.
Ⓥ SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.
Ⓥ Technology Instrument Corp., 1058 Main St., Waltham 54, Mass.
Ⓥ Varian Associates, 99 Washington St., San Carlos, Calif.
Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

METERS—*Impedance & Phase Angle Audio*

Ⓥ Technology Instrument Corp., 1058 Main St., Waltham 54, Mass.

METERS—*Light*

Ⓥ Adair & Rramstine, 314 Beaubien St., Detroit 26, Mich.
Davies Laboratories, Inc., 4705 Queenbury Rd., Riverdale, Md.
Ⓥ DEJUR-AMSCO CORP., Northern Blvd., at 45th St., Long Island City 1, N. Y. ADV. PG. 267.
Ⓥ GENERAL ELECTRIC CO., Apparatus Div., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Ⓥ HICKOK ELECTRICAL INSTRUMENT CO., 10514 Dupont Ave., Cleveland, Ohio. ADV. PG. 215.
Ⓥ Manufacturers Engr. & Equip. Corp., Willow Grove, Pa.
Ⓥ MARION ELECTRICAL INSTRUMENT CO., Manchester, N. H. ADV. PG. 135.
Ⓥ Welch Scientific Co., W. M., 1515 Sedgwick St., Chicago 10, Ill.
Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

METERS—*Medical*

Ⓥ Beede Electrical Instrument Co., Inc., Penacook, N. H.
Electric Design & Mfg. Corp., Burlington, Iowa.
Ⓥ EL-TRONICS, INC., 2649 N. Howard St., Philadelphia 33, Pa. ADV. PG. 238.
Ⓥ Farrand Optical Co., Inc., Bronx Blvd. at 238th St., New York 66, N. Y.
Ⓥ Photocon Research Products, 1062 N. Allen Ave., Pasadena 7, Calif.

METERS—*Microwave*

Ⓥ Frequency Standards Corp., Box 66, Eatontown, N. J.
Ⓥ POLYTECHNIC RESEARCH & DEVELOPMENT CO., INC., 202 Tillary St., Brooklyn 1, N. Y. ADV. PG. 56, 57.
Ⓥ SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.
Ⓥ Varian Associates, 99 Washington St., San Carlos, Calif.
Ⓥ Weymouth Instrument Co., 1440 Commercial St., East Weymouth 89, Mass.

METERS—*Modulation*

See Also Monitors, Modulation.

Ⓥ BROWNING LABORATORIES, INC., 750 Main St., Winchester, Mass. ADV. PG. 30.
Ⓥ Burlington Instrument Co., Burlington, Iowa.
Ⓥ Doolittle Radio, Inc., 7421 S. Loomis Blvd., Chicago 36, Ill.
Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Ⓥ HEWLETT-PACKARD CO., 395 Page Mill Rd., Palo Alto, Calif. ADV. PG. 68, 69.
Monitor Products Co., 915 Fremont Ave., So. Pasadena, Calif.
Ⓥ PANORAMIC RADIO PRODUCTS, INC., 10 South Second Ave., Mt. Vernon, N. Y. ADV. PG. 270.
Ⓥ REEVES-HOFFMAN CORP., 321 Cherry St., Carlisle, Pa. ADV. PG. 32.
Ⓥ Simpson Electric Co., Div. of American Gage & Machine Co., 5200 W. Kinzie St., Chicago 44, Ill.
Ⓥ SYLVANIA ELECTRIC PRODUCTS, INC., Emporium, Pa. ADV. PG. 286 to 290.

METERS—*Moisture*

American Instrument Co., 8030 Georgia Ave., Silver Spring, Md.
Ⓥ Associated Research, Inc., 3758 W. Belmont, Chicago 18, Ill.
Ⓥ Berkeley Scientific Co., Richmond, Calif.
Ⓥ Delmhorst Instrument Co., 155 Cornelia St., Boonton, N. J.
Ⓥ Farnsen Electronics, Inc., 1171 New York Ave., Huntington Station, N. Y.
Ⓥ Manson Instruments, Ltd., 23 Beaver St., New York 4, N. Y.
Ⓥ MEASUREMENTS CORP., Boonton, N. J. ADV. PG. 136.
Ⓥ Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Roberts Aves., Philadelphia 44, Pa.
Sentex, Inc., 91 Cambridge St., Boston, Mass.
Ⓥ Tech Laboratories, Inc., Bergen & Edsall Blvd., Palisades Park, N. J.
Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

METERS—*Null*

Ⓥ Automatic Temperature Control Co., Inc., 5211 Pulaski Ave., Philadelphia 44, Pa.
Ⓥ BARKER & WILLIAMSON, 238 Fairfield Ave., Upper Darby, Pa. ADV. PG. 269.
Ⓥ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ FREED TRANSFORMER CO., INC., 1718 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 143.
Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Ⓥ HEWLETT-PACKARD CO., 395 Page Mill Rd., Palo Alto, Calif. ADV. PG. 68, 69.
Ⓥ MARION ELECTRICAL INSTRUMENT CO., Manchester, N. H. ADV. PG. 130.
Ⓥ Technology Instrument Corp., 1058 Main St., Waltham 54, Mass.

METERS—*Output*

Ⓥ Assembly Products Inc., Chagrin Falls 6, Ohio.
Ⓥ BIRD ELECTRONIC CORP., 1800 E. 38th St., Cleveland 14, Ohio. ADV. PG. 184, 185.
Ⓥ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Dumont Pa., 137 Central Ave., Newark 4, N. J.
Ⓥ ELECTRONIC INSTRUMENT CO., INC., 276 Newport St., Brooklyn 12, N. Y. ADV. PG. 274.
Ⓥ Fairchild Recording Equipment Corp., 154th St. & 7th Avenue, Whitestone, N. Y.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Ⓥ International Instruments, Inc., 331 East St., New Haven 11, Conn.
Ⓥ JONES ELECTRONICS CO., M. C., Bristol, Conn. ADV. PG. 138.
M-Maida Silver Co., Inc., 1240 Main St., Hartford 3, Conn.
Ⓥ Manson Instruments, Ltd., 23 Beaver St., New York 4, N. Y.
Ⓥ MARION ELECTRICAL INSTRUMENT CO., Manchester, N. H. ADV. PG. 130.
Radio Design Co., 1353 Sterling Place, Brooklyn, N. Y.
Ⓥ SHALLCROSS MFG. CO., 10 Jackson Ave., Collingdale, Pa. ADV. PG. 221.
Ⓥ Simpson Electric Co., Div. of American Gage & Machine Co., 5200 W. Kinzie St., Chicago 44, Ill.
Ⓥ SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.
Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

METERS—*Panel*

Ⓥ ART-LLOYD METAL PRODUCTS CORP., 2073 Cropsey Ave., Brooklyn 14, N. Y. ADV. PG. 272.
Ⓥ Bailey Meter Co., 1044 Ivanhoe Rd., Cleveland 10, Ohio.
Ⓥ Beede Electrical Instrument Co., Inc., Penacook, N. H.
Ⓥ Burlington Instrument Co., Burlington, Iowa.
Ⓥ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ DEJUR-AMSCO CORP., Northern Blvd. at 45th St., Long Island City 1, N. Y. ADV. PG. 267.
Electric Design & Mfg. Corp., Burlington, Iowa.
Ⓥ Fairchild Recording Equipment Corp., 154th St. & 7th Avenue, Whitestone, N. Y.
Ⓥ FERRANTI ELECTRIC, INC., 30 Rockefeller Plaza, New York 20, N. Y. ADV. PG. 81.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ HICKOK ELECTRICAL INSTRUMENT CO., 10514 Dupont Ave., Cleveland, Ohio. ADV. PG. 215.
Ⓥ INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
Ⓥ International Instruments, Inc., 331 East St., New Haven 11, Conn.
Ⓥ J. B. T. INSTRUMENTS, INC., 441 Chapel St., New Haven 8, Conn. ADV. PG. 261.
Ⓥ MARION ELECTRICAL INSTRUMENT CO., Manchester, N. H. ADV. PG. 130.
Ⓥ Meters, Inc., 915 Westfield Blvd., Indianapolis 20, Ind.
Ⓥ Roller-Smith, Bethlehem, Pa.
Ⓥ Sensitive Research Instrument Corp., 9 Elm St., Mt. Vernon, N. Y.
Ⓥ Sheffield Instrument Corp., 2021 N. Lincoln St., Burbank, Calif.
Ⓥ SHURITE METERS, 61 Hamilton St., New Haven 8, Conn. ADV. PG. 216.
Ⓥ Simpson Electric Co., Div. of American Gage & Machine Co., 5200 W. Kinzie St., Chicago 44, Ill.
Ⓥ Triplett Electrical Instrument Co., 286 Harmon Rd., Bluffton, Ohio.
Ⓥ Welch Scientific Co., W. M., 1515 Sedgwick St., Chicago 10, Ill.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

METERS—*pH Meters, Recorders & Comparators*

Ⓥ Bailey Meter Co., 1044 Ivanhoe Rd., Cleveland 10, Ohio.
Ⓥ Bristol Co., The, Waterbury 20, Conn.
Ⓥ Central Scientific Co., 1700 Irving Park Rd., Chicago 13, Ill.
Ⓥ Coleman Instruments, Inc., 318 Madison St., Maywood, Ill.
Ⓥ Fisher Scientific Co., 717 Forbes St., Pittsburgh 19, Pa.
Harshaw Scientific Div. of The Harshaw Chemical Co., 1945 E. 97th St., Cleveland 6, Ohio.
Ⓥ J. Matte Chemical Products Co., Towson 4, Baltimore, Md.
Ⓥ Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
Ⓥ Marconi Instruments, Ltd., 23 Beaver St., New York 4, N. Y.
Ⓥ Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Roberts Aves., Philadelphia 44, Pa.
Ⓥ National Technical Laboratories, 820 Mission St., South Pasadena, Calif.
Photovolt Corp., 95 Madison Ave., New York 16, N. Y.
Ⓥ Thwing-Albert Instrument Co., 5351 Pulaski Ave., Philadelphia 44, Pa.
Ⓥ Welch Scientific Co., W. M., 1515 Sedgwick St., Chicago 10, Ill.
Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

METERS—*Phase Angle*

Ⓥ Clarke Instrument Corp., 910 King St., Silver Spring, Md.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Heat-ing Instrument Co., Box 1275, Hampton, Va.
Ⓥ KROHN-HITE INSTRUMENT CO., 580 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 128.
Ⓥ Technology Instrument Corp., 1058 Main St., Waltham 54, Mass.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

METERS—*Photoelectric Reflection*

Ⓥ American Scientific Co., P. O. Box 1, Highbridge Station, New York 52, N. Y.
Ⓥ G-M LABORATORIES, INC., 4313 N. Knox Ave., Chicago, Ill. ADV. PG. 142.
Harshaw Scientific Div. of The Harshaw Chemical Co., 1945 E. 97th St., Cleveland 6, Ohio.
Ⓥ INSTRUMENT DEVELOPMENT LABORATORIES, INC., Needham Heights, Mass. ADV. PG. 243.
Photovolt Corp., 95 Madison Ave., New York 16, N. Y.
Ⓥ Rubicon Co., 3751 Ridge Ave., Philadelphia, Pa.
Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

METERS—*Power Factor*

Ⓥ Esterline-Angus Co., Inc., P. O. Box 596, Indianapolis 6, Ind.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Ⓥ HICKOK ELECTRICAL INSTRUMENT CO., 10514 Dupont Ave., Cleveland, Ohio. ADV. PG. 215.
Ⓥ Marconi Instruments, Ltd., 23 Beaver St., New York 4, N. Y.
Ⓥ Roller-Smith, Bethlehem, Pa.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

METERS—*Q*

Ⓥ BOONTON RADIO CORP., Boonton, N. J. ADV. PG. 107.
Ⓥ ELECTRONIC MEASUREMENTS CO., Red Bank, N. J. ADV. PG. 139.
Ⓥ FREED TRANSFORMER CO., INC., 1718 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 143.
Ⓥ Marconi Instruments Ltd., 23 Beaver St., New York 4, N. Y.
Ⓥ Technology Instrument Corp., 1058 Main St., Waltham 54, Mass.

METERS—*RF Power*

Ⓥ BIRD ELECTRONIC CORP., 1800 E. 38th St., Cleveland 14, Ohio. ADV. PG. 184, 185.
Ⓥ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ HEWLETT-PACKARD CO., 395 Page Mill Rd., Palo Alto, Calif. ADV. PG. 68, 69.
Ⓥ International Instruments, Inc., 331 East St., New Haven 11, Conn.
Ⓥ JONES ELECTRONICS CO., M. C., Bristol, Conn. ADV. PG. 138.
Ⓥ Marconi Instruments Ltd., 23 Beaver St., New York 4, N. Y.
Ⓥ POLYTECHNIC RESEARCH & DEVELOPMENT CO., INC., 202 Tillary St., Brooklyn 1, N. Y. ADV. PG. 56, 57.
Ⓥ Precision Electronics, 641 Milwaukee Ave., Chicago 22, Ill.
Ⓥ Rollin Co., 2670 N. Fair Oak Ave., Pasadena 3, Calif.
Ⓥ SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.
Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

METERS—*Sound Level*

Ⓥ Burlington Instrument Co., Burlington, Iowa.
Electro-Mechanical Instrument Co., 812 Chetsnut St., Perkatie, Pa.
Ⓥ Fairchild Recording Equipment Corp., 154th St. & 7th Avenue, Whitestone, N. Y.
Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Ⓥ International Instruments, Inc., 331 East St., New Haven 11, Conn.
Ⓥ KAY ELECTRIC CO., 14 Maple Ave., Pine Brook, N. J. ADV. PG. 199.
Ⓥ Massa Laboratories, 3868 Carnegie St., Cleveland, Ohio.
Ⓥ Simpson Electric Co., Div. American Gage & Machine Co., 5200 W. Kinzie St., Chicago 44, Ill.
Ⓥ Triplett Electrical Instrument Co., 286 Harmon Rd., Bluffton, Ohio.
Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

METERS—*Standing Wave Ratio*

Ⓥ Aeronautical Communications Equipment, Inc., 3090 Douglas Rd., Miami 34, Fla.
Ⓥ Cancer Corp., 14315 Bessemer St., P. O. Box 361, Van Nuys, Calif.
Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Ⓥ HEWLETT-PACKARD CO., 395 Page Mill Rd., Palo Alto, Calif. ADV. PG. 68, 69.
Ⓥ JONES ELECTRONICS CO., M. C., Bristol, Conn. ADV. PG. 138.

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

Ⓥ POLYTECHNIC RESEARCH & DEVELOPMENT CO., INC., 202 Tillary St., Brooklyn 1, N. Y. ADV. PG. 56, 57.
Ⓥ Rulon Co., 2019 N. Fair Oaks Ave., Pasadena 3, Calif.
Ⓥ SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.
Ⓥ Varian Associates, 99 Washington St., San Carlos, Calif.
Ⓥ Weymouth Instrument Co., 1440 Commercial St., East Weymouth 89, Mass.

METERS—*Tension*

Ⓥ Inspection Instrument Corp., 85 Madison Ave., New York 16, N. Y.
Ⓥ Tinius Olsen & Co., Inc., W. C., 5410 W. Harrison St., Chicago 44, Ill.
Ⓥ Weld Instrument Co., Harvard, Mass.
Ⓥ Wire Fastwood Corp., Keen & Summer Sts., Paterson, N. J.

METERS—*Thermocouple*

Ⓥ Assembly Products, Inc., Chagrin Falls 6, Ohio.
Ⓥ Bristol Co., The, Waterbury 20, Conn.
Ⓥ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ HICKOK ELECTRICAL INSTRUMENT CO., 10514 Dupont Ave., Cleveland, Ohio. ADV. PG. 215.
Ⓥ Illinois Testing Labs., Inc., 420 N. LaSalle St., Chicago 10, Ill.
Ⓥ International Instruments, Inc., 331 East St., New Haven 11, Conn.
Ⓥ Meters, Inc., 915 Westfield Blvd., Indianapolis 20, Ind.
Ⓥ RAWSON ELECTRICAL INSTRUMENT CO., 111 Potter St., Cambridge 42, Mass. ADV. PG. 156.
Ⓥ Sensitive Research Instrument Corp., 9 Elm Ave., Mt. Vernon, N. Y.
Ⓥ Simpson Electric Co., Div. of American Gage & Machine Co., 5208 W. Kinzie St., Chicago 44, Ill.
Ⓥ Triplett Electrical Instrument Co., 286 Harmon Rd., Bluffton, Ohio.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.
Ⓥ Wheelco Instruments Co., 847 W. Harrison St., Chicago 7, Ill.

METERS—*Vibration*

Ⓥ AIRCRAFT ELECTRONICS ASSOCIATES, INC., 1031 New Britain Ave., Hartford 10, Conn. ADV. PG. 214.
Ⓥ Associated Research, Inc., 3758 W. Belmont, Chicago 18, Ill.
Ⓥ Baldwin Co., The, 791 Main St., Worcester, Mass.
Ⓥ Commercial Research Labs., Inc., 20 Bartlett Ave., District X, Mt. Vernon, N. Y.
Ⓥ Consolidated Engineering Corp., 620 N. Lake Ave., Pasadena 4, Calif.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Ⓥ M. B. MFG. CO., 1060 State St., New Haven 11, Conn. ADV. PG. 222.
Ⓥ PANORAMIC RADIO PRODUCTS, INC., 15 South Second Ave., Mt. Vernon, N. Y. ADV. PG. 253.
Ⓥ SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.

METERS—*Viscosity*

Ⓥ Fischer & Porter Co., Hatboro, Pa.
Ⓥ Gilmer Schantz Co., 719 Fisher St., Pittsburgh 24, Pa.
Ⓥ Gardner Lab., Inc., Henry A., 4723 Elm St., Bethesda 14, Md.
Ⓥ Hornaday Scientific Div. of The Hanshaw Chemical Co., 1945 E. 97th St., Cleveland 6, Ohio.
Ⓥ Manufacturers Engr. & Equip. Corp., Willow Grove, Pa.
Ⓥ Tech Laboratories, Inc., Bergen & Edsall Blvds., Palisades Park, N. J.

METERS—*Wave*

American Electronworking Co., 2132 Luther Ave., Los Angeles, Calif.
Ⓥ Automatic Signal Division, 200 Regent St., East Norwalk, Conn.
Ⓥ Daystrom, Inc., 1428 Market St., Denver 2, Colorado.
Ⓥ Frequency Standards Corp., Box 66, Linwood, N. J.
Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Ⓥ LAVOIE LABORATORIES, Morganville, N. J. ADV. PG. 193.
Ⓥ Measure Instruments, Ltd., 23 Beaver St., New York 4, N. Y.
Ⓥ MICO INSTRUMENT CO., 80 Trowbridge St., Cambridge 38, Mass. ADV. PG. 265.
Ⓥ Microwave Equipment Co., Inc., North Caldwell, N. J.
Ⓥ POLYTECHNIC RESEARCH & DEVELOPMENT CO., INC., 202 Tillary St., Brooklyn 1, N. Y. ADV. PG. 56, 57.
Ⓥ SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.
Ⓥ Varian Associates, 99 Washington St., San Carlos, Calif.
Woodworking, Inc., 3000 W. Olive Ave., Burbank, Calif.

METERS, WOW AND FLUTTER

Ⓥ BRUSH DEVELOPMENT CO., 3405 Perkins Ave., Cleveland 14, Ohio. ADV. PG. 124, 125.
Ⓥ Furst Electronics, 10A S. Jefferson St., Chicago 6, Ill.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 13 to 22, Inside Back and Back Covers.

METERS—*X-Ray Intensity*

Ⓥ Anton Electronic Laboratories, Inc., 1226-1230 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ EL-TRONICS, INC., 2649 N. Howard St., Philadelphia 33, Pa. ADV. PG. 238.
Ⓥ General Electric X-Ray Corp., 4855 W. McGeoch Ave., Milwaukee, Wis.
Hanshaw Scientific Div. of The Hanshaw Chemical Co., 1945 E. 97th St., Cleveland 6, Ohio.
Ⓥ Kelley-Koett Mfg. Co., Instrument Div., 12 E. 6th St., Covington, Ky.
Ⓥ Marconi Instruments, Ltd., 23 Beaver St., New York 4, N. Y.
Ⓥ Nucleonic Corp. of America, The, 497 Union St., Brooklyn 31, N. Y.
Ⓥ Picker X-Ray Corp., 300 Fourth Ave., New York 10, N. Y.
Ⓥ Special Instruments Laboratory, Inc., 1504 Highland Ave., Knoxville, Tenn.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

MICA

See Insulation Materials

MICROAMMETERS

Ⓥ Assembly Products, Inc., Chagrin Falls 6, Ohio.
Ⓥ Associated Research, Inc., 3758 W. Belmont, Chicago 18, Ill.
Ⓥ Beede Electrical Instrument Co., Inc., Penacook, N. H.
Ⓥ BETA ELECTRIC CORP., 1762 3rd Ave., New York 29, N. Y. ADV. PG. 171.
Ⓥ Burlington Instrument Co., Burlington, Iowa.
Coastwise Electronics Corp., Inc., 130 N. Beverly Ave., Los Angeles, Calif.
Ⓥ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles, 15, Calif.
Ⓥ DEJUR-AMSCO CORP., Northern Blvd. at 45th St., Long Island City, N. Y. ADV. PG. 247.
Ⓥ Electro-Devices & Mfg. Corp., Burlington, Iowa.
Ⓥ G-M LABORATORIES, 4313 N. Knox Ave., Chicago, Ill. ADV. PG. 242.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Hanshaw Scientific Div. of The Hanshaw Chemical Co., 1945 E. 97th St., Cleveland 6, Ohio.
Ⓥ HICKOK ELECTRICAL INSTRUMENT CO., 10514 Dupont Ave., Cleveland, Ohio. ADV. PG. 215.
Ⓥ International Instruments, Inc., 331 East St., New Haven 11, Conn.
Ⓥ MACDONALD CO., INC., W. S., 33 University Rd., Cambridge 38, Mass. ADV. PG. 218.
Ⓥ MARION ELECTRICAL INSTRUMENT CO., Manchester, N. H. ADV. PG. 180.
Ⓥ Meters, Inc., 915 Westfield Blvd., Indianapolis 20, Ind.
Metropolitan Electronics & Instruments Co., 106 Fifth Ave., New York 11, N. Y.
Ⓥ National Technical Laboratories, 820 Mission St., South Pasadena, Calif.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 13 to 22, Inside Back and Back Covers.
Ⓥ RAWSON ELECTRICAL INSTRUMENT CO., 111 Potter St., Cambridge 42, Mass. ADV. PG. 156.
Ⓥ Roller-Smith, Bethlehem, Pa.
Ⓥ Sensitive Research Instrument Corp., 9 Elm Ave., Mt. Vernon, N. Y.
Ⓥ Simpson Electric Co., Div. of American Gage & Machine Co., 5208 W. Kinzie St., Chicago 44, Ill.
Supreme Inc., Greenwich, Miss.
Ⓥ Triplett Electrical Instrument Co., 286 Harmon Road, Bluffton, Ohio.
Ⓥ Welch Scientific Co., W. M., 1515 Sedgwick St., Chicago 10, Ill.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

MICRO-MICROAMMETERS

Ⓥ Allen Cott Winders, Inc., Stamford, Conn.
Ⓥ BETA ELECTRIC CORP., 1762 3rd Ave., New York 29, N. Y. ADV. PG. 171.
Ⓥ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Industrial Control Co., 1462 Undercliff Ave., New York 52, N. Y.
Ⓥ MILLIVAC INSTRUMENTS, Box 3027, New Haven, Conn. ADV. PG. 182.
Ⓥ National Technical Laboratories, 820 Mission St., South Pasadena, Calif.
Process & Instruments, 60 Greenpoint Ave., Brooklyn 22, N. Y.
Ⓥ RAWSON ELECTRICAL INSTRUMENT CO., 111 Potter St., Cambridge 42, Mass. ADV. PG. 156.
Ⓥ Vyro Mfg. Co., Inc., Box 638, Garland, Texas.

MICROFARADAMETERS

Ⓥ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Simpson Electric Co., Div. of American Gage & Machine Co., 5208 W. Kinzie St., Chicago 44, Ill.
Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

MICROMETERS—*Electronic*

Ⓥ Carson Microometer Corp., 2 E. Main St., Little Falls, N. J.
Ⓥ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ Electro Products Labs., Inc., 549 W. Randolph St., Chicago 6, Ill.
Ⓥ INDUSTRIAL ELECTRONICS, INC., 2467 Woodward Ave., Detroit, Mich. ADV. PG. 255.
Ⓥ Scientific Inc., Raymond M., 1469 Church St., N. W., Washington 5, D. C.

MICROPHONES—*Aircraft Type*

Ⓥ American Microphone Co., 370 S. Fair Oaks Ave., Pasadena 1, Calif.
Ⓥ AVIOMETER, Div. of Roanwell Corp., 442 Pacific St., Brooklyn 17, N. Y. ADV. PG. 66.
Ⓥ Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.
Ⓥ ELECTRO-VOICE, INC., Buchanan, Mich. ADV. PG. 207.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 13 to 22, Inside Back and Back Covers.

MICROPHONES—*Carbon*

Ⓥ American Microphone Co., 370 S. Fair Oaks Ave., Pasadena 1, Calif.
Ⓥ Automatic Electric Sales Corp., 1033 W. Van Buren St., Chicago 7, Ill.
Ⓥ AVIOMETER, Div. of Roanwell Corp., 442 Pacific St., Brooklyn 17, N. Y. ADV. PG. 66.
Ⓥ Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ Connecticut Telephone & Electric Div., Great American Industries, Inc., 70 Pearl St., Meriden, Conn.
Ⓥ Executive Radio, Inc., 7471 S. Loomis Blvd., Chicago 36, Ill.
Ⓥ ELECTRO-VOICE, INC., Buchanan, Mich. ADV. PG. 207.
Ⓥ Esser Engineering Co., 2995 Middlefield Rd., Palo Alto, Calif.
Ⓥ Holtzer-Cabot Mfg. Co., 125 University Place, New York 3, N. Y.
Ⓥ SHURE BROTHERS, INC., 225 W. Huron St., Chicago 10, Ill. ADV. PG. 39.
Ⓥ Soundcaster Corp., 146 Mimon St., New Haven, Conn.
Ⓥ Stancil-Hoffman Recording & Equipment Co., 21 W. 46th St., New York, N. Y.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Telephonics Corp., Park Ave., Huntington, N. Y.
Ⓥ TURNER CO., The, 909 17th St., N. E., Cedar Rapids, Iowa. ADV. PG. 59.
Ⓥ UNIVERSITY LOUDSPEAKERS, INC., 80 S. Kensico Ave., White Plains, N. Y. ADV. PG. 231.

MICROPHONES—*Condenser*

Ⓥ Altec Lansing Corp., 1161 Avenue of the Americas, New York 36, N. Y.
Ⓥ Harvey Radio Labs. & Supply Co., 4444 S. Otero Ave., Chicago 38, Ill.

MICROPHONES—*Contact*

Ⓥ American Microphone Co., 370 So. Fair Oaks Ave., Pasadena 1, Calif.
Ⓥ AMPERITE CO., 561 Broadway, New York 12, N. Y. ADV. PG. 218.
Ⓥ Astatic Corp., The, Conneaut, Ohio.
Ⓥ AVIOMETER DIV. OF ROANWELL CORP., 442 Pacific St., Brooklyn 17, N. Y. ADV. PG. 66.

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

Ⓥ**BRUSH DEVELOPMENT CO.**, 3405 Perkins Ave., Cleveland 14, Ohio. ADV. PG. 124, 125.
Ⓥ**ELECTRO-VOICE, INC.**, Buchanan, Mich. ADV. PG. 207.
Ⓥ Rowe Industries, 1702 Wayne St., Toledo 9, Ohio.
Ⓥ Speak-O-Phone Recording & Equipment Co., 23 W. 60th St., New York, N. Y.
Ⓥ**TURNER CO., THE**, 909 17th St., N. E. Cedar Rapids, Iowa. ADV. PG. 54.

MICROPHONES—*Crystal*

Ⓥ American Microphone Co., 370 So. Fair Oaks Ave., Pasadena 1, Calif.
Ⓥ Astatic Corp., The, Conneaut, Ohio.
Ⓥ**BRUSH DEVELOPMENT CO.**, 3405 Perkins Ave., Cleveland 14, Ohio. ADV. PG. 124, 125.
Ⓥ**ELECTRO-VOICE, INC.**, Buchanan, Mich. ADV. PG. 207.
Globe Phone Mfg. Co., 2 Linden St., Reading, Mass.
Ⓥ Massa Laboratories, 3868 Carnegie St., Cleveland, Ohio.
Ⓥ**SHURE BROTHERS, INC.**, 225 W. Huron St., Chicago 10, Ill. ADV. PG. 19.
Ⓥ Sonotone Corp., P. O. Box 200, Saw Mill River Rd., Elmsford, N. Y.
Tibbetts Industries, Inc., Camden, Maine.
Ⓥ**TURNER CO., THE**, 909 17th St., N. E., Cedar Rapids, Io. ADV. PG. 54.

MICROPHONES—*Dynamic*

Ⓥ Altec Lansing Corp., 161 Avenue of the Americas, New York 13, N. Y.
Ⓥ American Microphone Co., 370 So. Fair Oaks Ave., Pasadena 1, Calif.
Ⓥ**AMPERITE CO.**, 561 Broadway, New York 12, N. Y. ADV. PG. 218.
Ⓥ Astatic Corp., The, Conneaut, Ohio.
Ⓥ**AVIOMETER DIV. OF ROANWELL CORP.**, 662 Pacific St., Brooklyn 17, N. Y. ADV. PG. 66.
Ⓥ**ELECTRO-VOICE, INC.**, Buchanan, Mich. ADV. PG. 207.
Globe Phone Mfg. Co., 2 Linden St., Reading, Mass.
Ⓥ Permoflux Corp., 4900 W. Grand Ave., Chicago 39, Ill.
Ⓥ Racon Electric Co., 52 E. 19th St., New York 3, N. Y.
Ⓥ**RADIO CORP. OF AMERICA**, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
Ⓥ Remler Co., Ltd., 2101 Bryant St., San Francisco 10, Calif.
Ⓥ**SHURE BROTHERS, INC.**, 225 W. Huron St., Chicago 10, Ill. ADV. PG. 19.
Ⓥ Soundrite Corp., 146 Munson St., New Haven 4, Conn.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Telephonics Corp., Park Ave., Huntington, N. Y.
Ⓥ**TURNER CO., THE**, 909 17th St., N. E. Cedar Rapids, Iowa. ADV. PG. 54.

MICROPHONES, NOISE CANCELLING

Ⓥ**AVIOMETER DIV. OF ROANWELL CORP.**, 662 Pacific St., Brooklyn 17, N. Y. ADV. PG. 66.
Ⓥ**ELECTRO VOICE, INC.**, Buchanan, Mich. ADV. PG. 207.
Ⓥ Telephonics Corp., Park Ave., Huntington, N. Y.

MICROPHONES—*Velocity*

Ⓥ Altec Lansing Corp., 161 Avenue of the Americas, New York 13, N. Y.
Ⓥ**AMPERITE CO.**, 561 Broadway, New York 12, N. Y. ADV. PG. 218.
Ⓥ**ELECTRO-VOICE, INC.**, Buchanan, Mich. ADV. PG. 207.
Ⓥ National Polytronics, Inc., 2430 Atlantic Ave., Brooklyn, N. Y.
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(V) CRAMER CO., INC., R. W., Box 13, Centerbrook, Conn. ADV. PG. 268.

(V) Fastener Motor Products Corp., 565 W. Washington Blvd., Chicago 6, Ill.

(V) Globe Doerfler Mechanisms, 37-61 80th St., Jackson Heights, L. I., N. Y.

(V) GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.

(V) Gleason-Avery Inc., Auburn, N. Y.

(V) Globe Industries, 1224 Superior Pl., Dayton, Ohio.

(V)Gorrell & Gorrell, Haworth, N. J.
(V)Hagen Mfg. Co., Inc., Baraboo, Wis.
(V)Hansen Mfg. Co., Inc., Princeton 10, Ind.
(V)HAYDON CO., A. W., THE, 232 N. Elm St., Waterbury, Conn. ADV. PG. 236.
(V)HAYDON MFG. CO., INC., 564 E. Elm St., Torrington, Conn. ADV. PG. 102, 103.
(V)Holtzer-Cabot Div. of National Pneumatic Co., Inc., 125 Amory St., Boston 19, Mass.
(V)Machine-O-Matic, Inc., P. O. Box 235, Ashley, Ohio.

MOUNTINGS—*Meter Back*

(V)LITTELFUSE, INC., 4757 Ravenswood Ave., Chicago 40, Ill. ADV. PG. 164.
(V)LORD MFG. CO., 1635 W. 12th St., Erie, Pa. ADV. PG. 55.
(V)Manhattan ELECTRICAL INSTRUMENT CO., Manchester, N. H. ADV. PG. 130.
(V)RICHARDSON CO., THE, 2760 Lake St., Melrose Park, Ill. ADV. PG. 144.

MOUNTINGS—*Vibration and Shock*

(V)AEROLITE ELECTRONIC HARDWARE CORP., 607 26th St., Union City, N. J. ADV. PG. 198.
(V)BARRY CORP., THE, 179 Sidney St., Cambridge, Mass. ADV. PG. 159.
(V)Doolittle Radio, Inc., 7421 S. Loomis Blvd., Chicago 36, Ill.
(V)FEDERAL SCREW PRODUCTS INC., 224 W. Huron St., Chicago 10, Ill. ADV. PG. 275.
(V)GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
(V)General Tire & Rubber Co., Silentbloc Div., Wabash, Ind.
(V)Hamilton Kent Mfg. Co., Kent, Ohio.
(V)LORD MFG. CO., 1635 W. 12th St., Erie, Pa. ADV. PG. 55.
(V)Mayfair Molded Products Corp., 4440 N. Elston Ave., Chicago 30, Ill.
(V)MB MFG. CO., 1060 State St., New Haven 11, Conn. ADV. PG. 253.
(V)Raion Electric Co., 52 E. 19th St., New York 3, N. Y.
(V)Remler Co., Ltd., 2101 Bryant St., San Francisco, Calif.
(V)ROBINSON AVIATION INC., Teterboro, N. J. ADV. PG. 67.
(V)Scionic Co., The, Div., United-Carr Fastener Corp., 359 Watertown St., Newtonville, Mass.
(V)United Shoe Machinery Corp., 140 Federal St., Boston, Mass.
(V)U. S. Rubber Co., 1230 Avenue of the Americas, New York 20, N. Y.

MOUNTS—*Antenna*

(V)AEROLITE ELECTRONIC HARDWARE CORP., 607 26th St., Union City, N. J. ADV. PG. 198.
(V)Brach Mfg. Corp., 200 Central Ave., Newark 4, N. J.
(V)Industrial Precision Products Co., 315-325 N. Hoyne Ave., Chicago 12, Ill.
(V)J F D MFG. CO., 6101-23 Sixteenth Ave., Brooklyn, N. Y. ADV. PG. 254, 264.
(V)La Magna Mfg. Co., Inc., East Rutherford, N. J.
(V)LaPointe-Plascomold Corp., Unionville, Conn.
(V)Lenz, Inc., 110 Ionia Ave., N.W., Grand Rapids 2, Mich.
(V)Oak Ridge Products Mfg. Div. of Video Television, Inc., 239 E. 127th St., New York 35, N. Y.
(V)Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
(V)Premax Products Div., Chisholm-Ryder Co., Inc., Niagara Falls 2, N. Y.
(V)Product Development Co., Inc., Arlington, N. J.
(V)Reeves Instrument Corp., 215 E. 91st St., New York, N. Y.
(V)Rostan Corp., 202 E. 44th St., New York 17, N. Y.
(V)Smith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.
South River Metal Products Co., South River, N. J.
(V)Taylor Fibre Co., Norristown, Pa.
(V)VECTRON, INC., 235 High St., Waltham, Mass. ADV. PG. 266.
(V)Waterproof Products Corp., Div. of The Gabriel Corp., 1523 E. 45th St., Cleveland 3, Ohio.
(V)Wind Turbine Co., Tower & Antenna Div., E. Market St. & Penna. R. R., West Chester, Pa.

MOUNTS—*Thermistor*

(V)GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
(V)GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.

MULTIPLIERS—*Crystal*

(V)KAY ELECTRIC CO., 14 Maple Ave., Pine Brook, N. J. ADV. PG. 193.
(V)KNIGHTS CO., JAMES, 131 S. Wells St., Sandwich, Ill. ADV. PG. 190.
(V)REEVES-HOFFMAN CORP., 321 Cherry St., Carlisle, Pa. ADV. PG. 32.
(V)SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.

MULTIPLIERS—*Frequency*

(V)BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 164.
(V)ELECTRONIC MEASUREMENTS CO., Red Bank, N. J. ADV. PG. 139.
(V)KAY ELECTRIC CO., 14 Maple Ave., Pine Brook, N. J. ADV. PG. 193.
(V)Miller Mfg. Co., James, 150 Exchange St., Malden, Mass.
(V)NORRMAN LABORATORIES, ERNST, Williams Bay, Wis. ADV. PG. 177.
(V)POLYTECHNIC RESEARCH & DEVELOPMENT CO., INC., 202 Tillary St., Brooklyn 1, N. Y. ADV. PG. 56, 57.
(V)POTTER INSTRUMENT CO., INC., 115 Cutter Mill Rd., Great Neck, N. Y. ADV. PG. 204.
(V)REEVES-HOFFMAN CORP., 321 Cherry St., Carlisle, Pa. ADV. PG. 32.
(V)SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.

MULTIPLIERS—*Meter*

(V)Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
(V)Dixon Co., 191 Central Ave., Newark 4, N. J.
(V)Esterline-Angus Co., Inc., P. O. Box 596, Indianapolis 6, Ind.
(V)GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
(V)HICKOK ELECTRICAL INSTRUMENT CO., 10514 Dupont Ave., Cleveland, Ohio. ADV. PG. 219.
(V)INSTRUMENT RESISTORS CO., 1016 Commerce Ave., Union, N. J. ADV. PG. 174, 175.
(V)INTERNATIONAL RESISTANCE CO., 401 N. Broad St., Philadelphia 8, Pa. ADV. PG. 88, 89.
(V)MARION ELECTRICAL INSTRUMENT CO., Manchester, N. H. ADV. PG. 130.
(V)Precision Resistor Co., 334 Badger Ave., Newark 8, N. J.
(V)Radio City Products Co., Inc., 152 W. 25th St., New York 1, N. Y.
(V)Reiner Electronics Co., 152 W. 25th St., New York, N. Y.
(V)Sensitive Research Instrument Corp., 9 Elm St., Mt. Vernon, N. Y.
(V)Tech Laboratories, Inc., Bergen & Edsall Blvds., Palisades Park, N. J.
(V)WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
(V)WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

MULTITESTERS

Bradshaw Instruments Co., 348 Livingston St., Brooklyn 17, N. Y.
(V)Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Douglas Radio Labs., 40 Wayland St., Boston, Mass.
(V)Feiler Engineering Co., 1601 S. Federal St., Chicago 16, Ill.
(V)HEATH CO., Benton Harbor, Mich. ADV. PG. 279.
(V)MARION ELECTRICAL INSTRUMENT CO., Manchester, N. H. ADV. PG. 130.
(V)Meters, Inc., 915 Westfield Blvd., Indianapolis 20, Ind.
Metropolitan Electronics & Instruments Co., 106 Fifth Ave., New York 11, N. Y.
(V)Oak Ridge Products Mfg. Div. of Video Television, Inc., 239 E. 127th St., New York 35, N. Y.
(V)Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Precision Apparatus Co., Inc., 92-27 Horace Harding Blvd., Elmhurst, N. Y.
(V)Precision Electronics, 641 Milwaukee Ave., Chicago 22, Ill.
(V)Radio City Products Co., Inc., 152 W. 25th St., New York 1, N. Y.
(V)RAWSON ELECTRICAL INSTRUMENT CO., 111 Potter St., Cambridge 42, Mass. ADV. PG. 156.
(V)Reiner Electronics Co., 152 W. 25th St., New York, N. Y.
(V)Sensitive Research Instrument Corp., 9 Elm Ave., Mt. Vernon, N. Y.
(V)SHALLCROSS MFG. CO., 10 Jackson Ave., Collingdale, Pa. ADV. PG. 221.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
(V)Simpson Electric Co., Div. of American Gage & Machine Co., 5208 W. Kinzie St., Chicago 44, Ill.
Stor-Measurements Co., 442 East 166th St., New York 56, N. Y.
(V)SYLVANIA ELECTRIC PRODUCTS, INC., Emporium, Pa. ADV. PG. 286 to 290.
(V)Triplett Electrical Instrument Co., 286 Harmon Rd., Bluffton, Ohio.
(V)WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

MULTIVIBRATORS

(V)Acme Telectronix Div. of NEA Service, Inc., West Third & Lakeside, Cleveland 13, Ohio.
(V)ELECTRONIC MEASUREMENTS CO., Red Bank, N. J. ADV. PG. 139.
(V)EL-TRONICS, INC., 2649 No. Howard St., Philadelphia Pa. ADV. PG. 238.
(V)GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
(V)INDUSTRIAL ELECTRONICS, INC., 2457 Woodward Ave., Detroit, Mich. ADV. PG. 255.
Monitor Products Co., 815 Fremont Ave., So. Pasadena, Calif.
(V)NORRMAN LABORATORIES, ERNST, Williams Bay, Wis. ADV. PG. 177.
(V)POTTER INSTRUMENT CO., INC., 115 Cutter Mill Rd., Great Neck, N. Y. ADV. PG. 204.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
(V)SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.
(V)Standard Electronics Research Corp., 2 East End Ave., New York 21, N. Y.

MUSIC SYSTEMS—*Industrial and Commercial*

(V)ALLIED RADIO CORP., 833 W. Jackson Blvd., Chicago 7, Ill. ADV. PG. 226.
(V)Altec Lansing Corp., 161 Avenue of the Americas, New York 13, N. Y.
(V)American Communications Corp., 306 Broadway, New York 7, N. Y.
(V)Boom Electric & Amplifier Co., 1227 W. Washington Blvd., Chicago 7, Ill.
(V)Collins Audio Products Co., P. O. Box 368, Westfield, N. J.
(V)Commercial Radio Sound Corp., 575 Lexington Ave., New York 22, N. Y.
(V)Fairchild Recording Equipment Corp., 154th St. & 7th Avenue, Whitestone, N. Y.
(V)Gale Dorothea Mechanisms, 37-61 85th St., Jackson Heights, L. I., N. Y.
Hartley Co., Ltd., H. A., 152 Hammersmith Rd., London W. 6, England.
(V)Lear, Inc., 110 Ionia Ave., N.W., Grand Rapids 2, Mich.
Lekay Mfg. Co., Ann Arbor, Mich.
(V)Magna Electronics Co., 3707-11 W. Jefferson, Los Angeles 16, Calif.
(V)Operadio Mfg. Co., 135th & Indiana Sts., St. Charles, Ill.
(V)Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
(V)Precision Electronics, 641 Milwaukee Ave., Chicago 22, Ill.
(V)RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 75, Inside Front and Back Covers.
Radio Music Corp., Port Chester, N. Y.
(V)Rauland-Borg Corp., 3523 W. Addison St., Chicago 18, Ill.
Riggs & Jeffreys, Inc., 140 Glenridge Ave., Montclair, N. J.
Schulmerich Electronics, Inc., Sellersville, Pa.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Western Sound & Electric Labs., Inc., 805 S. Fifth St., Milwaukee 4, Wis.
(V)Wurlitzer Co., Rudolph, The, N. Tonawanda, N. Y.

NAILS—*Special*

(V)Allmetal Screw Products Co., Inc., 33 Greene St., New York 13, N. Y.
(V)Aluminum Co. of America, Gulf Bldg., Pittsburgh, Pa.
(V)American Lauschner Corp., 333 W. 52nd St., New York 19, N. Y.
(V)Atlas Tack Corp., Pleasant St., Fairhaven, Mass.
(V)Chase Brass & Copper Co., Inc., Waterbury 91, Conn.
(V)Copperweld Steel Co., Glassport, Pa.
(V)Elastic Stop Nut Corp., 2330 Vaushall Rd., Union, N. J.
(V)Greene Mfg. Corp., G. G., Warren, Pa.
(V)Harper Co., H. M., 8200 Lehigh Ave., Morton Grove, Ill.
(V)Hassall, Inc., John, Clay & Oakland Sts., Brooklyn 22, N. Y.
(V)Judd Co., H. L., 87 Chambers St., New York 7, N. Y.
(V)National Screw & Mfg. Co., Cleveland 4, Ohio.
(V)Smith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.
(V)Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp., 500 Fifth Ave., New York 18, N. Y.

NAME PLATES

See Plates, Name

NEEDLES—*Cutting*

(V)Acton Co., Inc., H. W., 370 7th Ave., New York 1, N. Y.
(V)Aim Industries, 41 Union Sq., New York 3, N. Y.
(V)American Lauschner Corp., 333 W. 52nd St., New York 19, N. Y.
(V)AUDIO DEVICES, INC., 444 Madison Ave., New York 22, N. Y. ADV. PG. 37.
(V)CAPPS CO., INC., FRANK L., 246 W. 49th St., New York 19, N. Y. ADV. PG. 262.
(V)Ductone Co., Keyport, N. J.

Ⓥ indicates — IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

Ⓥ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
Ⓥ General Industries Co., Taylor & Olive Sts., Elyria, Ohio.
Ⓥ J. F. D. MFG. CO., 6101-23 Sixteenth Ave., Brooklyn 4, N. Y. ADV. PG. 254, 264.
Mirror Record Corp., 1133 Broadway, New York 10, N. Y.
Ⓥ North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
Ⓥ Permo, Inc., 6415 Ravenswood Ave., Chicago 26, Ill.
Ⓥ Recordisc Corp., 395 Broadway, New York, N. Y.
Ⓥ Rexolene Corp., 251 Fourth Ave., New York 10, N. Y.
Ⓥ REEVES SOUNDCRAFT CORP., 35-54 36th St., Long Island City, N. Y. ADV. PG. 171.
Ⓥ Sonic Phono Recording & Equipment Co., 23 W. 60th St., New York, N. Y.

NEEDLES—*Playback*

Ⓥ Alton Sq. Inc., H. W., 870-916 Blvd., Oak Park, Ill.
Ⓥ Arnold Engineering Co., 147 E. Ohio St., Chicago 11, Ill.
Astatic Corp., The, Conneaut, Ohio.
Ⓥ Audio Devices, Inc., 444 Madison Ave., New York 22, N. Y. ADV. PG. 47.
Ⓥ Capps & Co., Inc., Frank L., 338 W. 39th St., New York 18, N. Y. ADV. PG. 267.
Ⓥ Electro-Voice, Inc., Buchanan, Mich. ADV. PG. 237.
Ⓥ General Cement Mfg. Co., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
Ⓥ General Industries Co., Taylor & Olive Sts., Elyria, Ohio.
Ⓥ Gray Mfg. Co., H. A., 124 W. Wilbeam St., Milwaukee 1, Wis.
Ⓥ J. F. D. Mfg. Co., 6101-23 Sixteenth Ave., Brooklyn 4, N. Y. ADV. PG. 254, 264.
Ⓥ Jensen Industries Inc., 329 S. Wood St., Chicago 12, Ill.
Mirror Record Corp., 1133 Broadway, New York 10, N. Y.
Ⓥ Permo, Inc., 6415 Ravenswood Ave., Chicago 26, Ill.
Ⓥ Pfanstiehl Chemical Co., Metallurgical Div., 104 Lake View Ave., Waukegan, Ill.
Ⓥ Radio Corp. of America, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 34-35 (Tube Test and Rack Cover).
Ⓥ Recordisc Corp., 395 Broadway, New York, N. Y.
Ⓥ Rexolene Corp., 251 Fourth Ave., New York 10, N. Y.
Ⓥ REEVES SOUNDCRAFT CORP., 35-54 36th St., Long Island City, N. Y. ADV. PG. 171.
Ⓥ Rivet Diamond Tool Co., 172 Green St., Boston 30, Mass.
Ⓥ Shure Brothers, Inc., 225 W. Huron St., Chicago 10, Ill. ADV. PG. 276.
Ⓥ Sonic Phono Recording & Equipment Co., 23 W. 60th St., New York, N. Y.
Ⓥ Turner Corp., 909 N. Broadway, Kokomo 2, N. Y.
Ⓥ Universal Microphone Co., Inglewood, Calif.
Ⓥ Webster Electric Co., 1900 Bloomingdale Ave., Racine 99, Wis.

NETWORKS—*Directional Antenna Phasing*

Ⓥ Andrew Corp., 363 E. 75th St., Chicago 19, Ill.
Ⓥ Barker & Williamson, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ Collins Radio Co., Cedar Rapids, Iowa.
Ⓥ Gates Radio Co., Quincy, Ill.
Ⓥ General Electric Co., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 6 to 18.
Ⓥ Johnson Co., E. F., Waseca, Minn.
Ⓥ Network Mfg. Corp., Bayonne, N. J.
Ⓥ Radio Corp. of America, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 34-35 (Tube Test and Rack Cover).

NETWORKS—*Matching*

Ⓥ Altec Lansing Corp., 161 Sixth Ave. (at 9th St.), New York 13, N. Y.
Ⓥ Andrew Corp., 363 E. 75th St., Chicago 19, Ill.
Ⓥ Barker & Williamson, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ Cinema Engineering Co., 1510 W. Verdugo Ave., Burbank, Calif. ADV. PG. 166.
Coil Winders, Inc., 61 Bergen St., Brooklyn 2, N. Y.
Ⓥ Collins Radio Co., Cedar Rapids, Iowa.
Ⓥ Communication Accessories Co., Box 345, 110th St. & Hillcrest Rd., Hickman Hills, Mo. ADV. PG. 178.
Ⓥ Daven Co., 191 Central Ave., Newark 4, N. J.
Ⓥ Gates Radio Co., Quincy, Ill.
Ⓥ J. F. D. Mfg. Co., 6101-23 Sixteenth Ave., Brooklyn 4, N. Y. ADV. PG. 254, 264.
Ⓥ Network Mfg. Corp., Bayonne, N. J.
Peerless Electrical Products Co., 6920 McKinley Ave., Los Angeles 1, Calif.
Ⓥ Racon Electric Co., 52 E. 19th St., New York 3, N. Y.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Stephens Mfg. Corp., 8538 Warner Drive, Culver City, Calif.
Ⓥ Tech Laboratories, Inc., Bergen & Edsall Blvds., Palisades Park, N. J.
Ⓥ Technical Appliance Corp., Sherburne, N. Y. ADV. PG. 261.
Vectron, Inc., 235 High St., Waltham, Mass. ADV. PG. 266.

NETWORKS—*Pulse Forming*

Ⓥ Aerovox Corp., 740 Belleville Ave., New Bedford, Mass.
Ⓥ Aircraft-Marine Products, Inc., 1523 N. Fourth St., Harrisburg, Pa.
Ⓥ Barker & Williamson, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ Berkshire Laboratories, P. O. Box 70, Concord, Mass.
Ⓥ Communication Accessories Co., Box 345, 110th St. Hillcrest Rd., Hickman Hills, Mo. ADV. PG. 178.
Ⓥ Condenser Products Co., 1375 N. Branch St., Chicago 22, Ill. ADV. PG. 213.
Ⓥ Deutschmann Corp., Tobe, 921 Providence Highway, Norwood, Mass.
Ⓥ General Electric Co., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ Sprague Electric Co., North Adams, Mass.
Ⓥ Tech Laboratories, Inc., Bergen & Edsall Blvds., Palisades Park, N. J.
Ⓥ U. S. Electronics Corp., 276 Warren St., Lyndhurst, N. J. ADV. PG. 266.

NEUTRON SOURCES

Ⓥ Canadian Radium & Uranium Corp., 630 Fifth Ave., New York 20, N. Y.
Ⓥ U. S. Radium Corp., 535 Pearl St., New York 7, N. Y.

NUTS

Ⓥ Aerolite Electronic Hardware Corp., 507 Sixth St., Union City, N. J. ADV. PG. 136.
Ⓥ Atlantic Screw Products Co., Inc., 33 Greene St., New York 13, N. Y.
Ⓥ Aluminum Co. of America, Gulf Bldg., Pittsburgh, Pa.
Ⓥ American Lauterbach Corp., 111 W. 52nd St., New York 19, N. Y.
Ⓥ Audiotex Co., 216-222 W. 18th St., New York, N. Y.
Ⓥ Blake & Johnson Co., Waterville 46, Conn. ADV. PG. 223.
Ⓥ Bundy Engineering Co., Inc., 107 Bruckner Blvd., New York 54, N. Y.
Ⓥ Central Screw Co., 3501 Shields Ave., Chicago 9, Ill.
Ⓥ Chase Brass & Copper Co., Inc., Waterbury 91, Conn.
Ⓥ Columbia Nut & Bolt Co., 945 Main St., Bridgeport 1, Conn.
Ⓥ Continental Screw Co., New Bedford, Mass.
Ⓥ Federal Screw Products Inc., 224 W. Huron St., Chicago 10, Ill. ADV. PG. 271.
Ⓥ Garrett Co., Inc., George K., D & Tioga Sts., Philadelphia 34, Pa.
Ⓥ General Cement Mfg. Co., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
Ⓥ Harper Co., H. M., 8200 Lehigh Ave., Morton Grove, Ill.
Ⓥ Insuline Corp. of America, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
Ⓥ Lamson & Sessions Co., 1971 W. 85th St., Cleveland, Ohio.
Ⓥ Lucas Incorporated, P. O. Box 57, Baltimore 3, Md.
Ⓥ National Screw & Mfg. Co., The, Cleveland 4, Ohio.
Ⓥ Palnut Co., Inc., 77 Cordier St., Irvington 11, N. J. ADV. PG. 178.
Ⓥ Penn Mfg. Co., 4700 Roosevelt Rd., Chicago 50, Ill.
Ⓥ Progressive Mfg. Co., 50 Norwood St., Torrington, Conn.
Ⓥ Rotor Mfg. Co., The, P. O. Box 1745, New Haven 8, Conn.
Ⓥ Republic Steel Corp., Republic Bldg., Cleveland 1, Ohio.
Ⓥ Shakeproof Inc., Div. of Illinois Tool Wks., 2501 N. Keeler Ave., Chicago 39, Ill.
Ⓥ Smith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.
Spaulding Fibre Co., Inc., 310 Wheeler St., Tonawanda, N. Y.
Ⓥ Standard Pressed Steel Co., Jenkintown 10, Pa.
Ⓥ Stover Lock Nut & Machinery Corp., Hilton & Holly Sts., Easton, Pa.
Ⓥ Stronghold Screw Products, Inc., 216-222 West Hubbard St., Chicago 10, Ill.
Ⓥ Tinnerman Products, Inc., 2038 Fulton Rd., Cleveland 13, Ohio.
Ⓥ United Carr Fastener Corp., Cambridge 42, Mass.

NUTS—*Self-Locking*

Beach Precision Parts Co., Boonton, N. J.
Ⓥ Boots Aircraft Nut Corp., 50 John St., Stamford, Conn.
Ⓥ Columbia Nut & Bolt Co., 945 Main St., Bridgeport 1, Conn.
Ⓥ Elastic Stop Nut Corp., 2330 Vauxhall Road, Union, N. J.
Ⓥ Federal Screw Products Inc., 224 W. Huron St., Chicago 10, Ill. ADV. PG. 271.
Ⓥ Garrett Co., Inc., George K., D & Tioga Sts., Philadelphia 34, Pa.
Ⓥ Harper Co., H. M., 8200 Lehigh Ave., Morton Grove, Ill.
Ⓥ Lamson & Sessions Co., 1971 W. 85th St., Cleveland, Ohio.
Ⓥ National Screw & Mfg. Co., The, Cleveland 4, Ohio.
Ⓥ Palnut Co., Inc., 77 Cordier St., Irvington 11, N. J. ADV. PG. 178.
Ⓥ Production Engineering Co., 173 Sargeant Ave., Clifton, N. J.
Ⓥ Shakeproof Inc., Div. of Illinois Tool Wks., 2501 N. Keeler Ave., Chicago 39, Ill.
Ⓥ Smith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.
Spaulding Fibre Co., Inc., 310 Wheeler St., Tonawanda, N. Y.
Ⓥ Standard Pressed Steel Co., Jenkintown 10, Pa.
Ⓥ Stover Lock Nut & Machinery Corp., Hilton & Holly Sts., Easton, Pa.
Ⓥ Stronghold Screw Products, Inc., 216-222 West Hubbard St., Chicago 10, Ill.
Ⓥ Tinnerman Products, Inc., 2038 Fulton Rd., Cleveland 13, Ohio.
Ⓥ United Carr Fastener Corp., Cambridge 42, Mass.

NUTS—*Self-Sealing*

Ⓥ Elastic Stop Nut Corp., 2330 Vauxhall Rd., Union, N. J.
Ⓥ Lamson & Sessions Co., 1971 W. 85th St., Cleveland, Ohio.
Ⓥ Radio Frequency Labs, Inc., Boonton 2, N. J. ADV. PG. 172.
Ⓥ Stronghold Screw Products Inc., 216-222 W. Hubbard St., Chicago 10, Ill.

OHMMETERS

Ⓥ Associated Research Inc., 3758 W. Belmont, Chicago 18, Ill.
Ⓥ Beede Electrical Instrument Co., Inc., Penacook, N. H.
Ⓥ Biddle Co., James G., 1316 Arch St., Philadelphia 7, Pa.
Bradshaw Instruments Co., 148 Livingston St., Brooklyn 17, N. Y.
Ⓥ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ Dillon & Co., Inc., W. C., 5401 W. Harrison St., Chicago 44, Ill.
Ⓥ Electronic Designs, Inc., Irvington, N. Y. ADV. PG. 194.
Ⓥ Electronic Measurements Co., Red Bank, N. J. ADV. PG. 139.
Ⓥ Esterline-Angus Co., Inc., P. O. Box 596, Indianapolis 6, Ind.
Ⓥ Keiser Engineering Co., 1601 S. Federal St., Chicago 16.
Ⓥ General Electric Co., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Heath Co., Benton Harbor, Mich. ADV. PG. 279.
Ⓥ Hickok Electrical Instrument Co., 10514 Dupont Ave., Cleveland, Ohio. ADV. PG. 215.
Ⓥ International Instruments, Inc., 331 East St., New Haven 11, Conn.
Ⓥ J. B. T. Instruments, Inc., 441 Chapel St., New Haven 8, Conn. ADV. PG. 261.
Ⓥ Jackson Electrical Instrument Co., 16 S. Patterson Blvd., Dayton 1, Ohio.
Ⓥ Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
Ⓥ Lenkurt Electric Corp., 12 Cess St., Springfield, Mass.
Ⓥ Marconi Instruments, Ltd., 23 Beaver St., New York 4, N. Y.
Ⓥ Marion Electrical Instrument Co., Manchester, N. H. ADV. PG. 130.
Metropolitan Electronics & Instruments Co., 104 Fifth Ave., New York 11, N. Y.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Precision Electronics, 441 Milwaukee Ave., Chicago 22, Ill.
Radio Design Co., 1353 Sterling Pl., Brooklyn, N. Y.
Ⓥ Rawson Electrical Instrument Co., 111 Potter St., Cambridge 42, Mass. ADV. PG. 154.
Ⓥ Roller-Smith, Bethlehem, Pa.
Ⓥ Shallcross Mfg. Co., 10 Jackson Ave., Collingdale, Pa. ADV. PG. 221.
Ⓥ Shurite Meters, 41 Hamilton St., New Haven 8, Conn. ADV. PG. 216.
Ⓥ Simpson Electric Co., Div. of American Gage & Machine Co., 5218 W. Kinzie St., Chicago 44, Ill.
Ⓥ Southwestern Industrial Electronic Co., 2831 Post Oak Rd., Houston 19, Texas.
Star Measurements Co., 442 East 166th St., New York 56, N. Y.

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

Ⓥ Sterling Mfg. Co., 9205 Detroit Ave., Cleveland 2, Ohio.
Sticht Co., Inc., Herman H., 27 Park Place, New York 7, N. Y.
Ⓥ Superior Instruments Co., 337 Fulton St., New York 7, N. Y.
Ⓥ Supreme, Inc., Greenwood, Miss.
Ⓥ SYLVANIA ELECTRIC PRODUCTS, INC., Emporium, Pa. ADV. PG. 286 to 290.
Ⓥ Welch Scientific Co., W. M., 1515 Sedgwick St., Chicago 10, Ill.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

OPTICAL EQUIPMENT AND OPTICAL SPECIALTIES

Ⓥ American Optical Co., Scientific Instrument Div., Box A, Buffalo 15, N. Y.
Arlington Electric Products, Inc., 500 W. 52nd St., New York 19, N. Y.
Ⓥ Bache & Co., Semon, 636 Greenwich St., New York 14, N. Y.
Ⓥ Bausch & Lomb Optical Co., 635 St. Paul St., Rochester 2, N. Y.
Ⓥ Buhl Optical Co., 1009 Beech Ave., Pittsburgh 12, Pa.
Ⓥ CLARK CRYSTAL CO., 2 Farm Rd., Marlboro, Mass. ADV. PG. 210.
Ⓥ Clarkstan Corp., 11927 S.W. Pico Blvd., Los Angeles 64, Calif.
Ⓥ Electro-Mechanical Research, Inc., Ridgefield, Conn.
Ⓥ Fairand Optical Co., Inc., Bronx Blvd. at 238th St., New York 66, N. Y.
Ⓥ Ferner Co., R. Y., 110 Pleasant St., Malden, Mass.
Ⓥ Guertner Scientific Corp., 1201 Wrightwood Ave., Chicago 14, Ill.
Ⓥ Geophysical Instrument Co., 1820 N. Nash St., Arlington, Va.
L & R Mfg. Co., 577 Elm St., Arlington, N. J.
Ⓥ Optical Film Engineering Co., 2125 Cherry St., Philadelphia 3, Pa.
Ⓥ Perkin-Elmer Corp., The, Glenbrook, Conn.
Polan Industries, 220 Eighth St., Huntington, W. Va.
Process & Instruments, 60 Greenpoint Ave., Brooklyn 22, N. Y.
Ⓥ Viewlex Inc., 35-01 Queens Blvd., Long Island City 1, N. Y.

OSCILLATORS—*Audio Fork Controlled*

Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Ⓥ Hathaway Instrument Co., 1315 S. Clarkson St., Denver 10, Colo.
MacLeod & Hanopol, 10 Joiner St., Charlestown 29, Mass.
Ⓥ MUIRHEAD & CO., LTD., Beckenham Kent England. ADV. PG. 71.
Ⓥ PHILAMON LABORATORIES, 5717 Third Ave., Brooklyn 20, N. Y. ADV. PG. 84.
Ⓥ Southwestern Industrial Electronic Co., 2831 Post Oak Rd., Houston 19, Texas.
Ⓥ Stancil-Hoffman Corp., 1016 N. Highland Ave., Hollywood 38, Calif.
Ⓥ TIMES FACSIMILE CORP., 229 W. 43rd St., New York 18, N. Y. ADV. PG. 50.

OSCILLATORS—*Audio Frequency*

Ⓥ ALDEN PRODUCTS CO., 117 No. Main St., Brockton 64, Mass. ADV. PG. 235.
Ⓥ Allen Lansing Corp., 161 Avenue of the Americas, New York 13, N. Y.
American Brush Technology, Inc., 57 Park Ave., New York 16, N. Y.
American Electroneering Co., 2112 S. La Brea Ave., Los Angeles, Calif.
Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ CENTRALAB DIV. OF GLOBE UNION, INC., 900 E. Keefe Ave., Milwaukee, Wis. ADV. PG. 64, 65.
Ⓥ Clough Brengle Co., 6014 N. Broadway, Chicago, Ill.
Coastline Electronics Corp., Inc., 130 N. Beaudry Ave., Los Angeles, Calif.
Ⓥ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ Daven Co., 191 Central Ave., Newark 4, N. J.
Ⓥ ELECTRONIC INSTRUMENT CO., INC., 276 Newport St., Brooklyn 12, N. Y. ADV. PG. 274.
Ⓥ ELECTRONIC MEASUREMENTS CO., Red Bank, N. J. ADV. PG. 139.
Ⓥ Electronic Workshop, Inc., 351 Bleecker St., New York 14, N. Y.
Ⓥ EL-TRONICS, INC., 2649 No. Howard St., Philadelphia 33, Pa. ADV. PG. 238.
Erie Radio Labs., Inc., E. Stewart Ave., Garden City, N. Y.
Ⓥ FREED TRANSFORMER CO., INC., 171a Weirfield St., Brooklyn 27, N. Y. ADV. PG. 148.
Ⓥ Gates Radio Co., Quincy, Ill.
Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Ⓥ HEATH CO., Benton Harbor, Mich. ADV. PG. 279.
Ⓥ HEWLETT-PACKARD CO., 395 Page Mill Rd., Palo Alto, Calif. ADV. PG. 68, 69.
Ⓥ Instrument Electronics, 42-17A Douglaston Parkway, Douglaston, L. I., N. Y.
Ⓥ Jackson Electrical Instrument Co., 16 S. Patterson Blvd., Dayton 1, Ohio.
Ⓥ Marconi Instruments, Ltd., 23 Beaver St., New York 4, N. Y.
Ⓥ MEASUREMENTS CORP., Boonton, N. J. ADV. PG. 145.
Monitor Products Co., 815 Fremont Ave., So. Pasadena, Calif.
Ⓥ MUIRHEAD & CO., INC., Beckenham Kent England. ADV. PG. 71.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Phillips Petroleum Co., Special Products Div., Bartlesville, Okla.
Ⓥ Radex Corp., 2076 N. Elston Ave., Chicago 14, Ill.
Ⓥ Radio City Products Co., Inc., 152 W. 25th St., New York 1, N. Y.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75. Inside Back and Back Covers.
Ⓥ RAYTHEON MFG. CO., Power Tube Div., Waltham 54, Mass. ADV. PG. 257.
Ⓥ Reiner Electronics Co., 152 W. 25th St., New York, N. Y.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ Southwestern Industrial Electronic Co., 2831 Post Oak Rd., Houston 19, Texas.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W.C. 2, England.
Ⓥ Supreme, Inc., Greenwood, Miss.
Ⓥ SYLVANIA ELECTRIC PRODUCTS, INC., Emporium, Pa. ADV. PG. 286 to 290.
Ⓥ Tech Laboratories, Inc., Bergen & Edsall Blvds., Palisades Park, N. J.
Ⓥ Triumph Mfg. Co., 913 W. Van Buren St., Chicago 7, Ill.
Ⓥ Weinschel Engineering Co., 123 William St., New York 7, N. Y.

OSCILLATORS—*Cavity*

Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Davies Laboratories, Inc., 4705 Queensbury Rd., Riverdale, Md.
Ⓥ ELECTRONIC MEASUREMENTS CO., Red Bank, N. J. ADV. PG. 139.
Ⓥ KAY ELECTRIC CO., 14 Maple Ave., Pine Brook, N. J. ADV. PG. 193.
Ⓥ Polarad Electronics Corp., 100 Metropolitan Ave., Brooklyn 11, N. Y.
Ⓥ POLYTECHNIC RESEARCH & DEVELOPMENT CO., INC., 202 Tillary St., Brooklyn 1, N. Y. ADV. PG. 56, 57.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.
Ⓥ Weymouth Instrument Co., 1440 Commercial St., East Weymouth 89, Mass.
Woodwelding, Inc., 3000 W. Olive Ave., Burbank, Calif.

OSCILLATORS—*Crystal*

American Electroneering Co., 2112 La Brea Ave., Los Angeles, Calif.
Atlas Electric Products Co., P. O. Box 1591, Erie, Pa.
Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ Bassett Inc., Rex, 307-11 N. W. 1st Ave., Fort Lauderdale, Fla.
Ⓥ BLILEY ELECTRIC CO., Union Station Bldg., Erie, Pa. ADV. PG. 136.
Burnett Radio Lab., Wm. W. L., 4814 Idaho St., San Diego, Calif.
Ⓥ CLARK CRYSTAL CO., 2 Farm Rd., Marlboro, Mass. ADV. PG. 210.
Ⓥ ELECTRONIC MEASUREMENTS CO., Red Bank, N. J. ADV. PG. 139.
Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Ⓥ KNIGHTS CO., James, 131 S. Wells St., Sandwich, Ill. ADV. PG. 190.
Ⓥ LAVOIE LABORATORIES, Morganville, N. J. ADV. PG. 151.
Ⓥ Marconi Instruments, Ltd., 23 Beaver St., New York 4, N. Y.
Ⓥ MEASUREMENTS CORP., Boonton, N. J. ADV. PG. 145.
Ⓥ Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.
Monitor Products Co., 815 Fremont Ave., So. Pasadena, Calif.
Ⓥ NORRMAN LABORATORIES, ERNST, Williams Bay, Wis. ADV. PG. 177.
Ⓥ Polytech Devices, Inc., 1180½ E. Grand St., Elizabeth, N. J.
Ⓥ POTTER INSTRUMENT CO., INC., 115 Cutter Mill Rd., Great Neck, N. Y. ADV. PG. 204.
Ⓥ Premier Crystal Labs., Inc., 79-89 Seventh Ave., New York 11, N. Y.
Ⓥ Press Wireless Mfg. Co., Inc., Cantiague Rd., Hicksville, L. I., N. Y.
Radio Specialty Mfg. Co., 2023 S. E. Sixth Ave., Portland 14, Ore.
Ⓥ REEVES-HOFFMAN CORP., 321 Cherry St., Carlisle, Pa. ADV. PG. 32.
Ⓥ Schuttig & Co., Inc., 9th & Kearney Sts., N. E., Washington 17, D. C.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ Transmitter Equipment Co., Inc., 345 Hudson St., New York 14, N. Y.
Ⓥ Valpey Crystals, Highland St., Holliston, Mass.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

OSCILLATORS, GRID DIP—*High Frequency & vhf*

Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ ELECTRONIC MEASUREMENTS CO., Red Bank, N. J. ADV. PG. 139.
LaRose & Associates, W. T., 646 Second Ave., Troy, N. Y.
Ⓥ MEASUREMENTS CORP., Boonton, N. J. ADV. PG. 145.
Ⓥ Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.

OSCILLATORS—*Microwave Power*

American Electroneering Co., 2112 S. Ladrea Ave., Los Angeles, Calif.
Ⓥ C. G. S. LABORATORIES, INC., 36 Ludlow St., Stamford, Conn. ADV. PG. 244.
Ⓥ Decimeter, Inc., 1430 Market St., Denver 2, Colo.
Ⓥ HEWLETT-PACKARD CO., 395 Page Mill Rd., Palo Alto, Calif. ADV. PG. 68, 69.
Ⓥ Microwave Equipment Co., Inc., North Caldwell, N. J.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Polarad Electronics Corp., 100 Metropolitan Ave., Brooklyn 11, N. Y.
Ⓥ POLYTECHNIC RESEARCH & DEVELOPMENT CO., INC., 202 Tillary St., Brooklyn 1, N. Y. ADV. PG. 56, 57.
Ⓥ RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.
Ⓥ Varian Associates, 99 Washington St., San Carlos, Calif.
Ⓥ Weymouth Instrument Co., 1440 Commercial St., East Weymouth 89, Mass.

OSCILLATORS—*Oven Crystal Control*

Atlas Electric Products Co., P. O. Box 1591, Erie, Pa.
Ⓥ Bassett Inc., Rex, 307-11 N. W. 1st Ave., Fort Lauderdale, Fla.
Ⓥ BLILEY ELECTRIC CO., Union Station Bldg., Erie, Pa. ADV. PG. 136.
Burnett Radio Lab., Wm. W. L., 4814 Idaho St., San Diego, Calif.
Ⓥ CLARK CRYSTAL CO., 2 Farm Rd., Marlboro, Mass. ADV. PG. 210.
Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
Ⓥ KNIGHTS CO., JAMES, 131 S. Wells St., Sandwich, Ill. ADV. PG. 190.
Monitor Products Co., 815 Fremont Ave., So. Pasadena, Calif.
Ⓥ NORRMAN LABORATORIES, ERNST, Williams Bay, Wis. ADV. PG. 177.
Ⓥ Polytech Devices, Inc., 1180½ E. Grand St., Elizabeth, N. J.
Ⓥ Premier Crystal Labs., Inc., 79-89 Seventh Ave., New York 11, N. Y.
Ⓥ Press Wireless Mfg. Co., Inc., Cantiague Rd., Hicksville, L. I., N. Y.
Ⓥ REEVES-HOFFMAN CORP., 321 Cherry St., Carlisle, Pa. ADV. PG. 32.

OSCILLATORS—*Radio Frequency*

Ⓥ Ajax Electrothermic Corp., Ajax Park, Trenton 5, N. J.
American Electroneering Co., 2112 La Brea Ave., Los Angeles, Calif.
Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ Bassett Inc., Rex, 307-11 N.W. 1st Ave., Fort Lauderdale, Fla.
Bradshaw Instruments Co., 348 Livingston St., Brooklyn 17, N. Y.
Burnett Radio Lab., Wm. W. L., 4814 Idaho St., San Diego, Calif.
Ⓥ CENTRALAB DIV. OF GLOBE UNION INC., 900 E. Keefe Ave., Milwaukee, Wis. ADV. PG. 64, 65.

V Indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

National Electronics Corp., Inc., 130 N. Beverly Ave., Los Angeles, Calif.
V Clough Brengle Co., 6014 N. Broadway, Chicago, Ill.
V Collins Radio Co., Cedar Rapids, Iowa.
V Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
V CORNING GLASS WORKS, Corning, N. Y. ADV. PG. 134.
V Decimeter Inc., 1430 Market St., Denver 2, Colorado.
V Electronic Engineering Corp., 624 Ridge Rd., Lyndhurst, N. J.
V ELECTRONIC MEASUREMENTS CO., Red Bank, N. J. ADV. PG. 139.
V EL-TRONICS, INC., 2647 N. Howard St., Philadelphia 33, Pa. ADV. PG. 238.
V Feiler Engineering Co., 1601 S. Federal St., Chicago 16, Ill.
V Gates Radio Co., Quincy, Ill.
V GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
V GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 68-69.
V Hays, Brothers, Plainfield, N. J.
V HEATH CO., Benton Harbor, Mich. ADV. PG. 279.
V HEWLETT-PACKARD CO., 395 Page Mill Rd., Palo Alto, Calif. ADV. PG. 68-69.
V HICKOK ELECTRICAL INSTRUMENT CO., 10514 Dupont Ave., Cleveland, Ohio. ADV. PG. 215.
V Jackson Electrical Instrument Co., 16 S. Patterson Blvd., Dayton 2, Ohio.
V KAY ELECTRIC CO., 14 Maple Ave., Pine Brook, N. J. ADV. PG. 193.
V LAMPKIN LABORATORIES, INC., Bradenton, Fla. ADV. PG. 278.
V La Rose & Associates, W. T., 446 Sendzik Ave., Troy, N. Y.
V MEASUREMENTS CORP., Boonton, N. J. ADV. PG. 145.
Metropolitan Electronics & Instruments Co., 106 Fifth Ave., New York 11, N. Y.
V Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.
V NORTHEAST RADIO CO., INC., 144-146 W. 22nd St., New York 11, N. Y. ADV. PG. 132, 143.
V Pilot Radio Products Mfg. Div. of Video Television, Inc., 324 E. 137th St., New York 51, N. Y.
V Pitcairn, Inc., Tioga and C Sts., Philadelphia 34, Pa.
V POLYTECHNIC RESEARCH & DEVELOPMENT CO., INC., 202 Tillary St., Brooklyn 1, N. Y. ADV. PG. 257.
Precision Apparatus Co., Inc., 92-27 Horace Harding Blvd., Elmhurst, N. Y.
V Premier Crystal Labs., Inc., 29-89 Seventh Ave., New York 11, N. Y.
V Press Wireless Mfg. Co., Inc., Carteret Rd., Wickatunk, N. J.
V RADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 32 to 35 Inside Back and Back Covers.
V RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 203.
V REEVES-HOFFMAN CORP., 621 Cherry St., Carlisle, Pa. ADV. PG. 32.
V Rek-O-Kut Co., 2970 N. Fair Oaks Ave., Pasadena 3, Calif.
V Rese Mfg. Co., 460 Washington St., Burlington, Iowa.
Sanborn Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
V Simpson Electric Co., Div. of American Gage & Machine Co., 5200 W. Kinzie St., Chicago 44, Ill.
V Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
V Superior Instruments Co., 227 Fulton St., New York 7, N. Y.
V Supreme, Inc., Greenwood, Miss.
V Technology Instrument Corp., 1348 Main St., Waltham 54, Mass.
V Transmitter Equipment Mfg. Co., 535 Hudson St., New York 14, N. Y.
Waltham Div., 19450 West 8 Mile Rd., Detroit 19, Mich.
V WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

OSCILLATORS—*Ultra Low Frequency*

V GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 68-69.
V HEWLETT-PACKARD CO., 395 Page Mill Rd., Palo Alto, Calif. ADV. PG. 68-69.
V KROHN-HITE INSTRUMENT CO., 580 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 128.

OSCILLATORS—*Ultrasonic*

V BARKER & WILLIAMSON, 237 Fairfield Ave., Upper Darby, Pa. ADV. PG. 143.
V BLILEY ELECTRIC CO., Union Station Bldg., Erie, Pa. ADV. PG. 136.
V CENTRALAB DIV. OF GLOBE UNION INC., 900 E. Keefe Ave., Milwaukee, Wis. ADV. PG. 58-59.
V CLARK CRYSTAL CO., 2 Farm Rd., Marlboro, Mass. ADV. PG. 219.
V Crystal Research Labs., Inc., 24 Allen St., Hartford, Conn.
V Gilfer Instrument Co., 901 Parker St., Pittsburgh 13, Pa.
V GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
V GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 68-69.
V HEWLETT-PACKARD CO., 395 Page Mill Rd., Palo Alto, Calif. ADV. PG. 68-69.
V KNIGHTS CO., JAMES, 151 S. Wells St., Sandwich, Ill.
Monitor Products Co., 815 Fremont Ave., So. Pasadena, Calif.
V Pierce Products Co., Whitney St., Framingham, Mass.
V Premier Crystal Labs., Inc., 29-89 Seventh Ave., New York 11, N. Y.
V RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 203.
Sheldon Electronics Co., 1201 Flushing Ave., Brooklyn, N. Y.
V Southwestern Industrial Electronics Co., 2831 Post Oak Rd., Houston 19, Tex.
V Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
V Submarine Signal Div., Raytheon Mfg. Co., Waltham 54, Mass.
V Technology Instrument Corp., 1348 Main St., Waltham 54, Mass.
V Valpey Crystals, Highland St., Holliston, Mass.

OSCILLOGRAPHS—*Direct Writing*

See Oscillographs, Recording

OSCILLOGRAPHS—*Multi-Element*

V Baldwin Locomotive Works, Philadelphia 42, Pa.
V BRUSH DEVELOPMENT CO., THE, 3405 Perkins Ave., Cleveland 14, Ohio. ADV. PG. 124, 125.
V CENTURY GEOPHYSICAL CORP., 1333 N. Utica, Tulsa 3, Oklahoma. ADV. PG. 237.
V Consolidated Engineering Corp., 620 N. Lake Ave., Pasadena 8, Calif.
V Edin Electronics Co., 257 Main St., Worcester, Mass.
V Electrical Corp., 65 Bank Ave., New Canaan, Conn.
V ELECTRONIC TUBE CORP., 1200 E. Mermaid Lane, Philadelphia 18, Pa. ADV. PG. 156.
Feiler Engineering Co., 1601 S. Federal St., Chicago 16, Ill.
V GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
V HEILAND RESEARCH CORP., 130 E. 5th Ave., Denver 9, Colo. ADV. PG. 242.
V Miller Corp., Wm., 362 W. Colorado St., Pasadena, Calif.
V Photocon Instrument Co., 6616 Detroit Ave., Cleveland 2, Ohio.
V RAHM INSTRUMENTS INC., 11 West Broadway, New York 7, N. Y. ADV. PG. 178.
V SANBORN CO., 39 Osborn St., Cambridge 39, Mass. ADV. PG. 219.
V Southwestern Industrial Electronics Co., 2831 Post Oak Rd., Houston 19, Texas.
V Tech Laboratories, Inc., Bergen & Edsall Blvds., Palisades Park, N. J.
V WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Z & W Machine Products Inc., Electronics Div., 5151 St. Clair Ave., Cleveland 3, Ohio.

OSCILLOGRAPHS—*Recording*

V ALDEN PRODUCTS CO., 117 No. Main St., Brockton 64, Mass. ADV. PG. 236.
V Baldwin Locomotive Works, Philadelphia 42, Pa.
V BRUSH DEVELOPMENT CO., THE, 3405 Perkins Ave., Cleveland 14, Ohio. ADV. PG. 124, 125.
V CENTURY GEOPHYSICAL CORP., 1333 N. Utica, Tulsa 3, Oklahoma. ADV. PG. 237.
V Consolidated Engineering Corp., 620 N. Lake Ave., Pasadena 8, Calif.
V Edin Electronics Co., 257 Main St., Worcester, Mass.
V Electrical Corp., 65 Bank Ave., New Canaan, Conn.
V ELECTRONIC TUBE CORP., 1200 E. Mermaid Lane, Philadelphia 18, Pa. ADV. PG. 156.
Engineering Lab., Inc., 607 E. 4th St., Tulsa 3, Okla.
V GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
V Gilfer Instrument Co., 901 Parker St., Pittsburgh 13, Pa.
V Graphic Instrument Co., 133 N. Clinton St., Chicago 6, Ill.
V Hathaway Instrument Co., 1315 S. Clarkson St., Denver 10, Colo.
V HEILAND RESEARCH CORP., 130 E. 5th Ave., Denver 9, Colo. ADV. PG. 242.
V KAY ELECTRIC CO., 14 Maple Ave., Pine Brook, N. J. ADV. PG. 193.
V Miller Corp., Wm., 362 W. Colorado St., Pasadena, Calif.
V Photocon Instrument Co., 6616 Detroit Ave., Cleveland 2, Ohio.
V RAHM INSTRUMENTS INC., 11 West Broadway, New York 7, N. Y. ADV. PG. 178.
V SANBORN CO., 39 Osborn St., Cambridge 39, Mass. ADV. PG. 219.
V Southwestern Industrial Electronics Co., 2831 Post Oak Rd., Houston 19, Texas.
V Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
V Tech Laboratories, Inc., Bergen & Edsall Blvds., Palisades Park, N. J.
V WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
V Z & W Machine Products Inc., Electronics Div., 5151 St. Clair Ave., Cleveland 3, Ohio.

OSCILLOGRAPHS—*Transient Study*

See Oscilloscopes, Cathode Ray

OSCILLOSCOPES—*Cathode Ray*

For Accessories—See Hoods, Viewing

American British Technology, Inc., 57 Park Ave., New York 16, N. Y.
V Baldwin Locomotive Works, Philadelphia 42, Pa.
V BROWNING LABORATORIES, INC., 750 Main St., Winchester, Mass. ADV. PG. 30.
V Central Scientific Co., 1700 Irving Park Rd., Chicago 13, Ill.
V Commercial Research Labs., Inc., 20 Bartlett Ave., Detroit 3, Mich.
V Cossor (Canada) Ltd., 301-303 Windsor St., Halifax, N. S., Canada.
V Du Mont Laboratories, Inc., Allen B., Instrument Div., 1000 Main Ave., Clifton, N. J.
V ELECTRONIC INSTRUMENT CO., INC., 276 Newport St., Brooklyn 12, N. Y. ADV. PG. 274.
V ELECTRONIC TUBE CORP., 1200 E. Mermaid Lane, Philadelphia 18, Pa. ADV. PG. 156.
Eitron, Inc., 407 N. Jackson St., Jackson, Miss.
V EL-TRONICS, INC., 2647 N. Howard St., Philadelphia 33, Pa. ADV. PG. 238.
V Federal Telecommunication Labs., Inc., 500 Washington Ave., Nutley 10, N. J.
V Feiler Engineering Co., 1601 S. Federal St., Chicago 16, Ill.
V Flint Electronics, 104 S. Jefferson St., Chicago 6, Ill.
V GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
V GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
V HEATH CO., Benton Harbor, Mich. ADV. PG. 279.
V HICKOK ELECTRICAL INSTRUMENT CO., 10514 Dupont Ave., Cleveland, Ohio. ADV. PG. 215.
V INDUSTRIAL ELECTRONICS, INC., 2857 Woodward Ave., Detroit 1, Mich. ADV. PG. 255.
V Jackson Electrical Instrument Co., 16 S. Patterson Blvd., Dayton 2, Ohio.
V LAVOIE LABORATORIES, Morganville, N. J. ADV. PG. 151.
Metropolitan Electronics & Instruments Co., 106 Fifth Ave., New York 11, N. Y.
V Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.
V Pitcairn, Inc., Tioga & C Sts., Philadelphia 34, Pa.
Precision Apparatus Co., Inc., 92-27 Horace Harding Blvd., Elmhurst, N. Y.
Process & Instruments, 60 Greenpoint Ave., Brooklyn 22, N. Y.
V RADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 32 to 35 Inside Back and Back Covers.
Sheldon Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
V Supreme, Inc., Greenwood, Miss.
V SYLVANIA ELECTRIC PRODUCTS, INC., Emporium, Pa. ADV. PG. 286 to 290.
V Tektronix, Inc., 712 S. E. Hawthorne Blvd., Portland 14, Ore.
V Telemeter Electronics Corp., 150 Broadway, New York, N. Y.
V Television Equipment Corp., 238 William St., New York 7, N. Y.
V Triumph Mfg. Co., 913 W. Van Buren St., Chicago 7, Ill.
V WATERMAN PRODUCTS CO., INC., 2440-64 Emerald St., Philadelphia 25, Pa. ADV. PG. 252.
V Welch Scientific Co., W. M., 1515 Sedgwick St., Chicago 10, Ill.
Z & W Machine Products Inc., Electronics Div., 5151 St. Clair Ave., Cleveland 3, Ohio.

OSCILLOSCOPES—*Portable Projection*

V BETA ELECTRIC CORP., 1762 Third Ave., New York 29, N. Y. ADV. PG. 175.
V Du Mont Laboratories, Inc., Allen B., Instrument Div., 1000 Main Ave., Clifton, N. J.
V ELECTRONIC INSTRUMENT CO., INC., 276 Newport St., Brooklyn 12, N. Y. ADV. PG. 274.
V HEATH CO., Benton Harbor, Mich. ADV. PG. 279.
V INDUSTRIAL ELECTRONICS, INC., 2857 Woodward Ave., Detroit 1, Mich. ADV. PG. 255.
V NATIONAL CO., INC., 61 Sherman St., Malden 48, Mass. ADV. PG. 33 to 36.
V Paulkner & Electronics Co., 272 Northland Ave., Buffalo 8, N. Y.
V Television Equipment Corp., 238 William St., New York 7, N. Y.
V Triumph Mfg. Co., 913 W. Van Buren St., Chicago 7, Ill.

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

OVENS—*Electric*

Ⓥ Acme Electric Heating Co., 1217 Washington St., Boston, Mass.
American Instrument Co., 8010 Georgia Ave., Silver Spring, Md.
Atlas Electric Products Co., P. O. Box 1591, Erie, Pa.
Ⓥ Central Scientific Co., 1700 Irving Park Rd., Chicago 13, Ill.
Ⓥ Eisler Engineering Co., Inc., 740 S. 13th St., Newark 3, N. J.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Hanshaw Scientific Div. of the Hanshaw Chemical Co., 1845 E. 47th St., Cleveland 6, Ohio.
Ⓥ KAHLE ENGINEERING CO., 1301 7th St., North Bergen, N. J. ADV. PG. 180, 181.
Ⓥ Kirk & Blum Mfg. Co., 2893 Spring Grove Ave., Cincinnati 25, Ohio.
Ⓥ Litton Industries, Sun Carlos, Calif.
Ⓥ STEINER-IVES CO., 16 Avenue L, Newark 5, N. J. ADV. PG. 271.
Ⓥ Thermador Electric Mfg. Co., 5119 District Blvd., Los Angeles 22, Calif.
Ⓥ Welch Scientific Co., W. M., 1515 Sedgwick St., Chicago 10, Ill.
Ⓥ Young Brothers Co., 1824 Columbus Rd., Cleveland, Ohio.

OVENS—*Infra-Red Drying*

Ⓥ Firstone Pressed Steel Corp., Fostoria, Ohio.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Miskella Infra-Red Co., The, E. 73rd & Grand Ave., Cleveland 4, Ohio.

PAINTS—*Conductive (For Printed Circuit)*

Ⓥ Aitkenn Colloids Corp., Port Huron, Mich.
Austin Co., The, O., 335 Throop Ave., Brooklyn 21, N. Y.
Ⓥ du Pont de Nemours & Co., Inc., E. I., Wilmington, Delaware.
Eastman Lacquer Mfg. Co., Lafayette, Ind.
Ⓥ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 23.
Ⓥ Hague & Co., Inc., Alfred, 227 34th St., Brooklyn, N. Y.
Ⓥ Hyen Co., Inc., A. C., 10th St. & 44th Ave., Long Island City 1, N. Y.
Ⓥ Klinck Chemical Co., 29 E. Madison St., Chicago 2, Ill.
Ⓥ MICRO CIRCUITS CO., New Buffalo, Mich. ADV. PG. 222.
Ⓥ Pittsburgh Corning Co., Gateway Center, Pittsburgh 22, Pa.

PANELS—*Instrument*

Ⓥ Ackrin Stamping Co., 1923 Nebraska Ave., Toledo 7, Ohio.
Ⓥ Acromark Co., The, 442 Monroe St., Elizabeth 4, N. J.
American Communications Corp., 306 Broadway, New York 7, N. Y.
Anderson Corp., 104 Brookline Ave., Boston, Mass.
Ⓥ ART-LLOYD METAL PRODUCTS CORP., 2973 Cropsey Ave., Brooklyn 14, N. Y. ADV. PG. 272.
Austin Co., O., 335 Throop Ave., Brooklyn 21, N. Y.
Ⓥ Bauer Co., N. S., 9 Montgomery St., Hillside, N. J.
Ⓥ Bailey Meter Co., 1044 Ivanhoe Rd., Cleveland 10, Ohio.
Ⓥ Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.
Ⓥ Bud Radio, Inc., 2118 E. 55th St., Cleveland 3, Ohio.
Ⓥ CINEMA ENGINEERING CO., 1910 W. Verdugo Ave., Burbank, Calif. ADV. PG. 186.
Ⓥ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ Cronome, Inc., 3701 Ravenswood Ave., Chicago, Ill.
Ⓥ Donnelly Electric & Mfg. Co., 3050 Washington St., Boston, Mass.
Ⓥ Doolittle Radio, Inc., 7421 S. Loomis Blvd., Chicago 36, Ill.
Ⓥ Etched Products Corp., 39-01 Queens Blvd., Long Island City, N. Y.
Ⓥ FALSTROM CO., 44 Falstrom Court, Passaic, N. J. ADV. PG. Inc.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Hopp Press, Inc., 460 W. 34th St., New York, N. Y.
Induction Mfg. Co., 11 New York Ave., Brooklyn, N. Y.
Ⓥ KARP METAL PRODUCTS CO., INC., 215 43rd St., Brooklyn 20, N. Y. ADV. PG. 53.
Ⓥ Kirk & Blum Mfg. Co., 2893 Spring Grove Ave., Cincinnati 25, Ohio.
Ⓥ Lamicoid Fabricators, Inc., 4545 W. Cortland St., Chicago 39, Ill.
Ⓥ LOJACK PRECISION CORP., 93 Worth St., New York 13, N. Y. ADV. PG. 261.
Lycoming Rubber Co., Muskegon Ave., Trenton, N. J.
Mycalex Corp., 111 W. Washington St., Chicago 2, Ill.
Ⓥ MICA INSULATOR CO., Schenectady 1, N. Y. ADV. PG. 212.
Ⓥ Minneapolis-Honeywell Regulator Co., 2753 Fourth Ave., S., Minneapolis, Minn.
Ⓥ MULTI METAL WIRE CLOTH CO., INC., 1350 Garrison Ave., New York 59, N. Y. ADV. PG. 66.
Ⓥ MYCALEX CORP. OF AMERICA, 60 Clifton Blvd., Clifton, N. J. ADV. PG. 161.
Ⓥ NATIONAL VULCANIZED FIBRE CO., Wilmington, Del. ADV. PG. 163.
Oak Ridge Products Mfg. Div. of Video Television, Inc., 239 E. 127th St., New York 35, N. Y.
Pierce Template Corp., 2646 N. Coral St., Philadelphia 25, Pa.
Plastic Accessories, Inc., 93 Mercer St., New York 12, N. Y.
Ⓥ Premier Metal Etching Co., 21-03 44th Ave., Long Island City, N. Y.
Printoid Inc., 95 Mercer St., New York, N. Y.
REF Mfg. Corp., Jericho Turnpike, Mineola, N. Y.
Ⓥ RICHARDSON CO., THE, 2767 Lake St., Melrose Park, Ill. ADV. PG. 144.
Ripley Co., Inc., P. O. Box 31, Middletown, Conn.
Smuckler & Co., Inc., A. F., 202 Tillary St., Brooklyn 1, N. Y.
Spaulding Fibre Co., Inc., 310 Wheeler St., Tonawanda, N. Y.
Stamford Metal Specialty Co., Inc., 429 W. Broadway, New York 12, N. Y.
Ⓥ Standard Electric Time Co., 89 Logan St., Springfield, Mass.
Sun Dial Corp., E. Passaic Ave., Caldwell Township, N. J.
Ⓥ Taylor Fibre Co., Norristown, Pa.
Vokar Corp., 7300 Huron River Drive, Dexter, Mich.
Ⓥ Waterbury Companies, Inc., Waterbury 90, Conn.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Ⓥ Wheeler Instruments Co., 847 W. Harrison St., Chicago 7, Ill.

PANELS—*Receiver & Transmitter*

American Communications Corp., 306 Broadway, New York 7, N. Y.
Ⓥ ART-LLOYD METAL PRODUCTS CORP., 2973 Cropsey Ave., Brooklyn 14, N. Y. ADV. PG. 272.
Austin Co., Inc., O., 335 Throop Ave., Brooklyn 21, N. Y.
Ⓥ Bud Radio, Inc., 2118 E. 55th St., Cleveland 3, Ohio.
Ⓥ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ Cronome, Inc., 3701 Ravenswood Ave., Chicago, Ill.
Ⓥ Donnelly Electric & Mfg. Co., 3050 Washington St., Boston, Mass.
Ⓥ Doolittle Radio, Inc., 7421 S. Loomis Blvd., Chicago 36, Ill.
Ⓥ Etched Products Corp., 39-01 Queens Blvd., Long Island City, N. Y.
Ⓥ Gates Radio Co., Quincy, Ill.
Ⓥ INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
Ⓥ Johnson Co., E. F., Waseca, Minn.
Ⓥ KARP METAL PRODUCTS CO., INC., 215 43rd St., Brooklyn 20, N. Y. ADV. PG. 53.
Ⓥ Langevin Mfg. Corp., 37 W. 65th St., New York 23, N. Y.
Ⓥ LOJACK PRECISION CORP., 93 Worth St., New York 13, N. Y. ADV. PG. 261.
Mycalex Corp., 111 W. Washington St., Chicago 2, Ill.
Ⓥ MULTI METAL WIRE CLOTH CO., INC., 1350 Garrison Ave., New York 59, N. Y. ADV. PG. 66.
Ⓥ MYCALEX CORP. OF AMERICA, 60 Clifton Blvd., Clifton, N. J. ADV. PG. 161.
Ⓥ NATIONAL CO., INC., 61 Sherman St., Malden 48, Mass. ADV. PG. 33 to 36.
Pierce Template Corp., 2646 N. Coral St., Philadelphia 25, Pa.
Printoid Inc., 95 Mercer St., New York, N. Y.
REF Mfg. Corp., Jericho Turnpike, Mineola, N. Y.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 79, Inside Back and Back Covers.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Smuckler & Co., Inc., A. F., 202 Tillary St., Brooklyn 1, N. Y.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

PANELS—*Relay Rack*

Ⓥ ALLIED CONTROL CO., INC., 2 East End Ave., New York 21, N. Y. ADV. PG. 98, 99.
American Communications Corp., 306 Broadway, New York 7, N. Y.
Ⓥ ART-LLOYD METAL PRODUCTS CORP., 2973 Cropsey Ave., Brooklyn 14, N. Y. ADV. PG. 272.
Ⓥ Autocall Co., The, Shelby, Ohio.
Ⓥ Bauer Co., N. S., 9 Montgomery St., Hillside, N. J.
Ⓥ Bud Radio, Inc., 2118 E. 55th St., Cleveland 3, Ohio.
Ⓥ CINEMA ENGINEERING CO., 1910 W. Verdugo Ave., Burbank, Calif. ADV. PG. 186.
Ⓥ Cinaudagraph Products Inc., 234 E. 146th St., New York 51, N. Y.
Ⓥ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ Donnelly Electric & Mfg. Co., 3050 Washington St., Boston, Mass.
Ⓥ Doolittle Radio, Inc., 7421 S. Loomis Blvd., Chicago 36, Ill.
Ⓥ Etched Products Corp., 39-01 Queens Blvd., Long Island City, N. Y.
Ⓥ Gates Radio Co., Quincy, Ill.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
Ⓥ Johnson Co., E. F., Waseca, Minn.
Ⓥ KARP METAL PRODUCTS CO., INC., 215 43rd St., Brooklyn 20, N. Y. ADV. PG. 53.
Ⓥ LOJACK PRECISION CORP., 93 Worth St., New York 13, N. Y. ADV. PG. 261.
Mycalex Corp., 111 W. Washington St., Chicago 2, Ill.
Ⓥ MULTI METAL WIRE CLOTH CO., INC., 1350 Garrison Ave., New York 59, N. Y. ADV. PG. 66.
Ⓥ MYCALEX CORP. OF AMERICA, 60 Clifton Blvd., Clifton, N. J. ADV. PG. 161.
Ⓥ NATIONAL CO., INC., 61 Sherman St., Malden 48, Mass. ADV. PG. 33 to 36.
Pierce Template Corp., 2646 N. Coral St., Philadelphia 25, Pa.
Printoid Inc., 95 Mercer St., New York, N. Y.
REF Mfg. Corp., Jericho Turnpike, Mineola, N. Y.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 79, Inside Back and Back Covers.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Smuckler & Co., Inc., A. F., 202 Tillary St., Brooklyn 1, N. Y.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

PAPER

See Insulation Materials

PAPER—*Facsimiles Recording*

Ⓥ ALDEN PRODUCTS CO., 117 N. Main St., Brockton 64, Mass. ADV. PG. 235.
Ⓥ Alfax Paper & Engineering Co., 40 Riverside Ave., Brockton 27, E. B., Mass.
Ⓥ Gorrell & Gorrell, Haworth, N. J.
Ⓥ Hogan Laboratories, Inc., 155 Perry St., New York 14, N. Y.
Ⓥ Kalid Division of General Aniline & Film Corp., 770 Amsterdam Ave., Johnson City, N. Y.
Ⓥ Schaetzler Inc., Peter J., 405 Lexington Ave., New York 17, N. Y.
Ⓥ TIMES FACSIMILE CORP., 229 W. 43rd St., New York 18, N. Y. ADV. PG. 50.
Ⓥ Western Union Telegraph Co., 60 Hudson St., New York 13, N. Y.

PERMEAMETERS—*High H*

Ⓥ Rubicon Co., 3751 Ridge Ave., Philadelphia, Pa.

PHENOLIC MOLDING COMPOUNDS

See Insulating Compounds

PHONOGRAPHS—*Electric Phonographs & Record Players*

Ⓥ Admiral Corp., 3800 Cortland St., Chicago 47, Ill.
Ⓥ Aine Industries, 41 Union Square, New York 3, N. Y.
Ⓥ Ark-Ray Products Co., Inc., 179 53rd St., Brooklyn, N. Y.
American Communications Corp., 306 Broadway, New York 7, N. Y.
Ⓥ Audio Industries, Michigan City, Ind.
Audio-Master Co., 23 W. 45th St., New York 19, N. Y.
Ⓥ Autocrat Radio Co., 3855 N. Hamilton Ave., Chicago, Ill.
Ⓥ Biogen Co., Inc., David, 663 Broadway, New York 12, N. Y.
Ⓥ Bowen & Co., Inc., 4712 Bethesda Ave., Bethesda, Md. Broadcasting Program Service, 23 W. 45th St., New York 19, N. Y.
Ⓥ Califone Corp., 1041 N. Sycamore Ave., Hollywood 38, Calif.
Ⓥ Carron Mfg. Co., 415 S. Aberdeen St., Chicago, Ill.
Ⓥ Cornet Radio & Television Corp., 500 W. 52nd St., New York 19, N. Y.
Ⓥ Crescent Industries, Inc., 4140 Belmont Ave., Chicago 41, Ill.
Ⓥ Electronic Workbee, Inc., 351 Bleecker St., New York 14, N. Y.
Ⓥ Emerson Radio & Phonograph Corp., 111 Eighth Ave., New York, N. Y.
Espey Mfg. Co., Inc., 528 E. 72nd St., New York, N. Y.
Ⓥ Fada Radio & Electric Co., Inc., 525 Main St., Bellevile, N. J.
Ⓥ Fairchild Recording Equipment Corp., 154th St. and 7th Ave., Whitestone, N. Y.
Ⓥ Gale Donathea Mechanisms, 37-61 85th St., Jackson Heights, L. I., N. Y.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.

Ⓥ indicates IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

Hartley Co., 156 - H. A., 152 Hammersmith Rd., London W. 6, England.
Electronic Research Labs., 1021 Callowhill St., Philadelphia 23, Pa.
M. P. Gilbert Installations, Fairfield 10, Conn.
Ⓥ Magna Electronics Co., 3707-11 W. Jefferson, Los Angeles 16, Calif.
Ⓥ Mark Industries, 2046, Liberty at Pennsylvania, Plymouth, Ind.
Mirror Recorder Corp., 1133 Broadway, New York 10, N. Y.
Ⓥ Newcomb Audio Products Co., 1824 Lexington Ave., Hollywood 28, Calif.
Ⓥ Rauland-Borg Corp., 3523 W. Addison St., Chicago 18, Ill.
Ⓥ RAYTHEON MFG. CO., Equipment Sales Dept., Waltham 54, Mass. ADV. PG. 257
Ⓥ Rek-O-Kut Co., Inc., 38-01 Queens Blvd., Long Island City, N. Y.
Riggs & Jeffreys, Inc., 135 Uxbridge Ave., Montclair, N. J.
Ⓥ Scott, Inc., Harmon Hoover, 385 Putnam Ave., Cambridge 39, Mass.
Seeburg Corp., J. P., 1500 N. Dayton Ave., Chicago 22, Ill.
Ⓥ Shevers, Inc., Harold, 123 W. 64th St., New York 23, N. Y.
Ⓥ Simpson Mfg. Co., Inc., Mark, 32-28 49th St., Long Island City 3, N. Y.
Symphonic Radio & Electronic Corp., 292-8 Main St., Cambridge 42, Mass.
Symphony Radio & Television Corp., 721 N. Martel Ave., Los Angeles 46, Calif.
Telequip Radio Co., 1401 S. Wabash Ave., Chicago, Ill.
Ⓥ Tele-Tone Radio Corp., 540 W. 58th St., New York 19, N. Y.
Ⓥ Thordarson Electric Mfg. Div., Maguire Industries, Inc., 500 W. Huron St., Chicago 10, Ill.
Western Sound & Electric Labs., Inc., 405 S. Fifth St., Milwaukee 4, Wis.
Ⓥ Wilcox Gay Corp., Charlotte, Michigan.
Ⓥ Z & N Machine Products Inc., Electronics Div., 5151 St. Clair Ave., Cleveland 3, Ohio.

PHOTOFLASH EQUIPMENT—*Electronic*

Ⓥ Amglo Corp., 4744 Lincoln Ave., Chicago 18, Ill.
Ⓥ Bremster Electric & Mfg. Co., Inc., 93 Brighton Ave., Boston 34, Mass.
Ⓥ Eastman Kodak Co., Industrial Photographic Sales Div., 343 State St., Rochester 4, N. Y.
Ⓥ Electronic Products Div., Epco Products, Inc., 2430 Arbutus Ave., Rockville 55, N. Y.
Elson Inc., 407 N. Jackson St., Jackson, Mich.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ HEILAND RESEARCH CORP., 130 E. 3rd Ave., Denver 9, Colo. ADV. PG. 242
Ⓥ INDUSTRIAL ELECTRONICS, INC., 2157 Woodward Ave., Detroit 1, Mich. ADV. PG. 260
Ⓥ Jon Products Co., 414 W. 42nd St., New York 18, N. Y.
Ⓥ Multibell Labs., Inc., 1076 Morena Blvd., San Diego 10, Calif.
Ⓥ Ramsite Labs., 1814 W. Grand Ave., Chicago 22, Ill.
Ⓥ Rockbestos & Hassop, 10 Miner St., Charlestown 29, Mass.
Ⓥ Manufacturers Engr. & Equip. Corp., Willow Grove, Pa.
Ⓥ Shoppan Research Products, 1062 N. Allen Ave., Pasadena 7, Calif.
Ⓥ Photographic Products, Inc., 958 N. Mansfield Ave., Hollywood 38, Calif.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ Thordarson Electric Mfg. Div., Maguire Industries, Inc., 500 W. Huron St., Chicago 10, Ill.

PHOTOGRAPHIC MATERIAL—*Films and Papers for Recording Instruments*

Ⓥ Ansco Div. of General Aniline & Film Corp., Binghamton, N. Y.
Atlas Electric Products Co., P. O. Box 1595, Erie, Pa.
Ⓥ du Pont de Nemours & Co., Inc., E. I., Wilmington, Delaware.
Ⓥ Eastman Kodak Co., Industrial Photographic Sales Div., 343 State St., Rochester 4, N. Y.
Ⓥ Haloid Co., The, 6 Haloid St., Rochester, N. Y.
Miller Corp., Wm., 862 W. Colorado St., Pasadena, Calif.
Ⓥ Peerless Photo Products, Shoreham, L. I., N. Y.

PHOTOGRAPHIC MATERIALS — *Spectrographic Instruments*

Ⓥ Eastman Kodak Co., Industrial Photographic Sales Div., 343 State St., Rochester 4, N. Y.
Ⓥ National Spectrographic Laboratories, Inc., 6300 Lake Ave., Cleveland 3, Ohio.

PHOTOGRAPHIC MATERIALS—*X Ray Films*

Ⓥ Ansco Div. of General Aniline & Film Corp., Binghamton, N. Y.
Ⓥ Du Pont de Nemours & Co., Inc., E. I., Wilmington, Delaware.
Ⓥ Eastman Kodak Co., Industrial Photographic Sales Div., 343 State St., Rochester 4, N. Y.
Ⓥ General Electric X-Ray Corp., 4855 W. McGeach Ave., Milwaukee, Wis.
Ⓥ North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.

PHOTOMETERS

Ⓥ Allen & Rhinehimer, 514 Southern St., Detroit 26, Mich.
Ⓥ American Scientific Co., P. O. Box 1, Highbridge Station, New York 52, N. Y.
Ⓥ Barclay Instruments Div., The Patent Button Co., Waterbury 88, Conn.
Ⓥ Brockway Mica Instruments, Inc., 1546 Second Ave., New York 28, N. Y.
Davies Laboratories, Inc., 4005 Queensbury Rd., Riverdale, Md.
Ⓥ Electronic Workshop, Inc., 102 Bleecker St., New York 12, N. Y.
Ⓥ Farrand Optical Co., Inc., Bronx Blvd. at 238th St., New York 66, N. Y.
Ⓥ Gardner Lab., Inc., Henry A., 4723 Elm St., Bethesda 14, Md.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Hardview Scientific Div. of The Hardview Chemical Co., 1945 E. 97th St., Cleveland 6, Ohio.
Ⓥ Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
Ⓥ National Technical Laboratories, 820 Mission St., South Pasadena, Calif.
Ⓥ Perkin Elmer Corp., The, Glenbrook, Conn.
Photovolt Corp., 95 Madison Ave., New York 16, N. Y.
Ⓥ Rubicon Co., 3751 Ridge Ave., Philadelphia, Pa.
Ⓥ Welch Scientific Co., W. M., 1515 Sedgwick St., Chicago 10, Ill.
Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

PH METERS, RECORDERS AND COMPARATORS

See Meters

PHOTOCOPYERS

See Machines

PHOTOTUBES AND PHOTOCELLS

See Tubes

PICKUPS—*Crystal*

See Crystal Cartridges

PICKUPS—*Industrial*

Applied Science Corp., of Princeton, The, P. O. Box 44, Princeton, N. J.
Ⓥ Control Engineering Corp., 863 Washington St., Canton, Mass.
Ⓥ FLADER, INC., FREDERIC, North Tonawanda, N. Y. ADV. PG. 240.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Hathaway Instrument Co., 1315 S. Clarkson St., Denver 10, Colo.

PICKUPS—*Magnetic*

Ⓥ Atlas Sound Corp., 1451 Avenue of the Americas, New York 19, N. Y.
Ⓥ Astatic Corp., The, Conneaut, Ohio.
Ⓥ Audak Co., 500 Fifth Ave., New York, N. Y.
Ⓥ Carlson Co., 1404 Hobart Blvd., Los Angeles 6, Calif.
Ⓥ Clarkstan Corp., 11925 S. W. Pico Blvd., Los Angeles 64, Calif.
Ⓥ Commercial Research Labs., Inc., 20 Bartlett Ave., Detroit 3, Mich.
Electro-Mechanical Instrument Co., 312 Chestnut St., Perkasie, Pa.
Ⓥ Fairchild Recording Equipment Corp., 154th St. and 7th Ave., Whitestone, N. Y.
Ⓥ Garrard Sales Corp., 134 Duane St., New York 13, N. Y.
Hartley Co., 156 - H. A., 152 Hammersmith Rd., London W. 6, England.
Ⓥ Hathaway Instrument Co., 1315 S. Clarkson St., Denver 10, Colo.
M. P. Gilbert Installations, Fairfield 10, Conn.
Ⓥ PICKERING & CO., 309 Woods Ave., Oceanside, L. I., N. Y. ADV. PG. 234.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 75. Inside Back and Back Covers.
Radio Music Corp., Port Chester, N. Y.
Ⓥ Rowe Industries, 1702 Wayne St., Toledo 9, Ohio.
Ⓥ Tyrrell Mfg. Co., 6760 W. Walton St., Chicago 51, Ill.
Ⓥ Webster-Electric Co., 1900 Clark St., Racine, Wis.

PICKUPS—*Photoelectric*

Ⓥ AMERICAN CHRONOSCOPE CORP., 316 W. First St., Mt. Vernon, N. Y. ADV. PG. 84
Ⓥ American Scientific Co., P. O. Box 1, Highbridge Station, New York 52, N. Y.
Ⓥ Astatic Corp., The, Conneaut, Ohio.
Ⓥ FORD INSTRUMENT CO., INC., 31-10 Thomson Ave., Long Island City, N. Y. ADV. PG. 272
Ⓥ POTTER INSTRUMENT CO., INC., 115 Cutter Mill Rd., Great Neck, N. Y. ADV. PG. 204
Ⓥ Standard Electronics Research Corp., 2 East End Ave., New York 21, N. Y.

PICKUPS—*Quartz Crystal*

Atlas Electric Products Co., P. O. Box 1595, Erie, Pa.
Ⓥ Commercial Research Laboratories, Inc., 20 Bartlett Ave., Detroit 3, Mich.
Ⓥ KNIGHTS CO., JAMES, 131 S. Wells St., Sandwich, Ill. ADV. PG. 199
Ⓥ Polytech Devices, Inc., 11804a E. Grand St., Elizabeth, N. J.
Ⓥ REEVES-HOFFMAN CORP., 321 Cherry St., Carlisle, Pa. ADV. PG. 32

PICKUPS—*Transcription and Phonograph*

Ⓥ Atlas Sound Corp., 1451 Avenue of the Americas, New York 19, N. Y.
Ⓥ American Microphone Co., 370 So. Fair Oaks Ave., Pasadena 1, Calif.
Ⓥ Astatic Corp., The, Conneaut, Ohio.
Ⓥ Audak Co., 500 Fifth Ave., New York, N. Y.
Ⓥ BRUSH DEVELOPMENT CO., 3405 Perkins Ave., Cleveland 14, Ohio. ADV. PG. 124, 125.
Ⓥ Clarkstan Corp., 11925 S. W. Pico Blvd., Los Angeles 64, Calif.
Ⓥ Fairchild Recording Equipment Corp., 154th St. and 7th Ave., Whitestone, N. Y.
Ⓥ Gates Radio Co., Quincy, Ill.
Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 9 to 18.
Ⓥ GRAY RESEARCH & DEVELOPMENT CO., 16 Arbor St., Hartford 1, Conn. ADV. PG. 239.
Ⓥ Lear, Inc., 110 Ionia Ave., N. W., Grand Rapids 2, Mich.
Ⓥ Livingston Electronic Corp., Livingston, N. J.
M. P. Gilbert Installations, Fairfield 10, Conn.
Ⓥ Proctor Laundex Corp., 133 N. 6th Ave., Mt. Vernon, N. Y.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 75. Inside Back and Back Covers.
Radio Music Corp., Port Chester, N. Y.
Ⓥ Sonotone Corp., P. O. Box 200, Saw Mill River Rd., Elmsford, N. Y.
Ⓥ Tetrad Corp., 60 N. Broadway, Yonkers 2, N. Y.

PILOT LIGHT ASSEMBLIES

Ⓥ AEROLITE ELECTRONIC HARDWARE CORP., 437 24th St., Union City, N. J. ADV. PG. 136
Ⓥ ALDEN PRODUCTS CO., 117 N. Main St., Brockton 64, Mass. ADV. PG. 235
Line Material Co., 20 3rd Colony Ave., Boston 27, Mass.
Ⓥ DIAL LIGHT CO. OF AMERICA, 900 Broadway, New York 3, N. Y. ADV. PG. 50
Ⓥ FEDERAL SCREW PRODUCTS, INC., 224 W. Huron St., Chicago 10, Ill. ADV. PG. 271
Ⓥ Industrial Devices, Inc., 22 State Rd., Edgewater, N. J.
Ⓥ Johnson Co., E. F., Waseca, Minn.
Ⓥ Muska Electric Mfg. Co., Inc., 30 South St., Mt. Vernon, N. Y.
Mycalex Fabricators, Inc., 5324 Ravenswood Ave., Chicago 40, Ill.
Ⓥ Mylar Co., Frank W., 1300 Soldiers Field Rd., Boston 35, Mass.
Ⓥ Pass & Seymour, Inc., Solvay Station, Syracuse, N. Y.
Ⓥ Pilmore Mfg. Co., 113 University Place, New York 3, N. Y.
Ⓥ R. N. M. Division, Elmes Wire Corp., Logansport, Ind.
Ⓥ RUSSELL & STOLL CO., INC., 125 Barclay St., New York 7, N. Y. ADV. PG. 233
Ⓥ Smith, Inc., Herman H., 405 44th St., Brooklyn 29, N. Y.
Solar Corp., 7400 Huron River Drive, Dexter, Mich.
Ⓥ Wade Electric Products Co., 211 Jacob St., Sturgis, Mich.

PILOTS—*Automatic*

Ⓥ Lear, Inc., 110 Ionia Ave., N. W., Grand Rapids 2, Mich.
Ⓥ SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.

PITCH

See Insulating Compounds

PIVOTS—*Instrumental Jewel*

Electronic Co. Inc., 60 Franklin St., East Orange, N. J.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

Ⓥ Miller Mfg. Co., M. A., 1169 E. 43rd St., Chicago 15, Ill.
Ⓥ Permo, Inc., 6415 Ravenswood Ave., Chicago 26, Ill.
Ⓥ Vallorbs Jewel Co., Lancaster, Pa.

PLASTIC MATERIALS

Allyls

Ⓥ Plaskon Division, Libbey-Owens-Ford Glass Co., 2112-24 Sylvan Ave., Toledo 6, Ohio.

Cellulose Acetate

American Products Mfg. Corp., Oleander & Dublin Sts., New Orleans 18, La.
Baer Co., N. S., 9 Montgomery St., Hillside, N. J.
Bamberger Corp., A., 44 Hewes St., Brooklyn 11, N. Y.
Ⓥ Celanese Corp. of America, 180 Madison Ave., New York 16, N. Y.
Dielectric Materials Co., 5315-17 N. Ravenswood Ave., Chicago 40, Ill.
Ⓥ du Pont de Nemours & Co., Inc., E. I., Wilmington, Delaware.
Ⓥ Hercules Powder Co., Inc., 900 Market St., Wilmington 99, Del.
Ⓥ Monsanto Chemical Co., Plastics Div., Springfield 2, Mass.
Ⓥ Oppenheimer Inc., Alan D., 582-586 Exchange St., Buffalo, N. Y.
Plastic Products Co., 20 Hudson St., New York 13, N. Y.
Ⓥ Plax Corp., P. O. Box 1019, Hartford, Conn.
Ⓥ Polymer Corp., The, Reading, Pa.
Ⓥ Tennessee Eastman Corp., Subsidiary Eastman Kodak Co., Kingsport, Tenn.

Cellulose Acetate Butyrate

Baer Co., N. S., 9 Montgomery St., Hillside, N. J.
Bamberger Corp., A., 44 Hewes St., Brooklyn 11, N. Y.
Dielectric Materials Co., 5315-17 N. Ravenswood Ave., Chicago 40, Ill.
Ⓥ Oppenheimer Inc., Alan D., 582-586 Exchange St., Buffalo, N. Y.
Ⓥ Plax Corp., P. O. Box 1019, Hartford, Conn.
Ⓥ Polymer Corp., The, Reading, Pa.
Ⓥ Tennessee Eastman Corp., Subsidiary Eastman Kodak Co., Kingsport, Tenn.

Cellulose Nitrate

Ⓥ du Pont de Nemours & Co., Inc., E. I., Wilmington, Del.
Ⓥ Hercules Powder Co., Inc., 900 Market St., Wilmington 99, Delaware.
Ⓥ Monsanto Chemical Co., Plastics Div., Springfield 2, Mass.
Ⓥ Oppenheimer Inc., Alan D., 582-586 Exchange St., Buffalo, N. Y.

Ethyl Cellulose

American Products Mfg. Co., Oleander and Dublin Sts., New Orleans 18, La.
Bamberger Corp., A., 44 Hewes St., Brooklyn 11, N. Y.
Ⓥ Dow Chemical Co., Midland, Mich.
Ⓥ Hercules Powder Co., Inc., 910 Market St., Wilmington 99, Del.
Ⓥ Oppenheimer Inc., Alan D., 582-586 Exchange St., Buffalo, N. Y.
Ⓥ Plax Corp., P. O. Box 1019, Hartford, Conn.
Ⓥ Polymer Corp., The, Reading, Pa.

Melamine Formaldehyde

Ⓥ American Cyanamid Co., Plastics Div., 30 Rockefeller Plaza, New York 20, N. Y.
Baer Co., N. S., 9 Montgomery St., Hillside, N. Y.
Ⓥ Monsanto Chemical Co., Plastics Div., Springfield 2, Mass.
Ⓥ NATIONAL VULCANIZED FIBRE CO., Wilmington, Del. ADV. PG. 183.
Ⓥ Parelyte Div., St. Regis Paper Co., 230 Park Ave., New York, N. Y.
Ⓥ Plaskon Division Libbey-Owens-Ford Glass Co., 2112-24 Sylvan Ave., Toledo 6, Ohio.
Plastics Products Co., 20 Hudson St., New York 13, N. Y.
Ⓥ RICHARDSON CO., THE, 2767 Lake St., Melrose Park, Ill. ADV. PG. 144.
Ⓥ Synthane Corp., Oaks, Pa.
Ⓥ Taylor Fibre Co., Norristown, Pa.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

Methyl Methacrylate

Bamberger Corp., A., 44 Hewes St., Brooklyn 11, N. Y.
Dielectric Materials Co., 5315-17 N. Ravenswood Ave., Chicago 40, Ill.
Ⓥ du Pont de Nemours & Co., Inc., E. I., Wilmington, Delaware.
Ⓥ Oppenheimer Inc., Alan D., 582-586 Exchange St., Buffalo, N. Y.
Plastics Products Co., 20 Hudson St., New York 13, N. Y.
Ⓥ Plax Corp., P. O. Box 1019, Hartford, Conn.
Ⓥ Rohm & Haas, Washington Square, Philadelphia 5, Pa.

Phenol Formaldehyde—(Phenolics)

Baer Co., N. S., 9 Montgomery St., Hillside, N. J.
Ⓥ Bakelite Div., Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y.
Ⓥ Borden Co., The, Chemical Div., 350 Madison Ave., New York 17, N. Y.
Ⓥ Catalin Corp. of America, 1 Park Ave., New York 16, N. Y.
Ⓥ Durez Plastics & Chemicals, Inc., 1921 Walck Rd., N. Tonawanda, N. Y.
Ⓥ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
Ⓥ GENERAL ELECTRIC CO., Chemical Dept., Pittsfield, Mass. ADV. PG. 5 to 18.
Ⓥ Monsanto Chemical Co., Plastics Div., Springfield 2, Mass.
Ⓥ NATIONAL VULCANIZED FIBRE CO., Wilmington, Del. ADV. PG. 183.
Ⓥ Parelyte Div., St. Regis Paper Co., 230 Park Ave., New York, N. Y.
Plastics Products Co., 20 Hudson St., New York 13, N. Y.
Ⓥ Reichhold Chemicals, Inc., 601-707 Woodward Heights Blvd., Detroit 20, Mich.
Ⓥ RICHARDSON CO., The, 2767 Lake St., Melrose Park, Ill. ADV. PG. 144.
Ⓥ Rogers Corp., Manchester, Conn.
Ⓥ Synthane Corp., Oaks, Pa.
Ⓥ Synvar Corp., 415 E. Front St., Wilmington, Del.
Ⓥ Taylor Fibre Co., Norristown, Pa.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

Polyethylene

Baer Co., N. S., 9 Montgomery St., Hillside, N. J.
Ⓥ Bakelite Div., Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y.
Bamberger Corp., A., 44 Hewes St., Brooklyn 11, N. Y.
Dielectric Materials Co., 5315-17 N. Ravenswood Ave., Chicago 40, Ill.
Ⓥ du Pont de Nemours & Co., Inc., E. I., Wilmington, Delaware.
Ⓥ Howard Mfg. Corp., 1401 S. Main St., Council Bluffs, Iowa.
Ⓥ Oppenheimer Inc., Alan D., 582-586 Exchange St., Buffalo, N. Y.
Plastics Products Co., 20 Hudson St., New York 13, N. Y.
Ⓥ Plax Corp., P. O. Box 1019, Hartford, Conn.
Ⓥ Polymer Corp., The, Reading, Pa.

Polystyrene

American Products Mfg. Corp., Oleander and Dublin Sts., New Orleans, 18, La.
Ⓥ Bakelite Div., Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y.
Bamberger Corp., A., 44 Hewes St., Brooklyn 11, N. Y.
Ⓥ Catalin Corp. of America, 1 Park Ave., New York 16, N. Y.
Dielectric Materials Co., 5315-17 N. Ravenswood Ave., Chicago 40, Ill.
Ⓥ Dow Chemical Co., Midland, Mich.
Ⓥ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
Ⓥ Koppers Co., Inc., Chemical Div., Koppers Bldg., Pittsburgh 19, Pa.
Ⓥ Monsanto Chemical Co., Plastics Div., Springfield 2, Mass.
Ⓥ Oppenheimer Inc., Alan D., 582-586 Exchange St., Buffalo, N. Y.
Plastics Products Co., 20 Hudson St., New York 13, N. Y.
Ⓥ Plax Corp., P. O. Box 1019, Hartford, Conn.

Polytetrafluoroethylene

Ⓥ Crane Packing Co., 1800 Cuyler Ave., Chicago 13, Ill.
Ⓥ du Pont de Nemours & Co., Inc., E. I., Wilmington, Delaware.

Resins

Ⓥ Bakelite Div., Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y.
Ⓥ Borden Co., The Chemical Div., 350 Madison Ave., New York 17, N. Y.
Ⓥ Catalin Corp. of America, 1 Park Ave., New York 16, N. Y.
Ⓥ Durez Plastics & Chemicals, Inc., 1921 Walck Rd., No. Tonawanda, N. Y.
Ⓥ GENERAL ELECTRIC CO., Chemical Dept., Pittsfield, Mass. ADV. PG. 5 and 18.
Ⓥ Goodrich Chemical Co., B. F., Rose Bldg., Cleveland 15, Ohio.
Ⓥ Goodyear Tire & Rubber Co., Inc., Chemical Div., 1144 E. Market St., Akron 16, Ohio.
Ⓥ Halowax Products Division, Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y.
Ⓥ Hercules Powder Co., Inc., 900 Market St., Wilmington 99, Del.
Ⓥ Marbon Corp., Gary, Ind.
Ⓥ Monsanto Chemical Co., Plastics Div., Springfield 2, Mass.
Ⓥ Paisley Products Inc., 1770 Canalport Ave., Chicago 16, Ill.
Ⓥ Plaskon Division, Libbey-Owens-Ford Glass Co., 2112-24 Sylvan Ave., Toledo 6, Ohio.
Ⓥ Reichhold Chemicals, Inc., 601-707 Woodward Heights Blvd., Detroit 20, Mich.
Ⓥ Schenectady Varnish Co., Schenectady, N. Y.
Ⓥ Sherwin-Williams Co., 101 Prospect Ave., N. W., Cleveland 1, Ohio.
Ⓥ Synvar Corp., 415 E. Front St., Wilmington, Del.
Ⓥ ZOPHAR MILLS, INC., 112-130 26th St., Brooklyn 32, N. Y. ADV. PG. 192.

Urea Formaldehyde

Ⓥ American Cyanamid Co., Plastics Div., 30 Rockefeller Plaza, New York 20, N. Y.
Ⓥ Borden Co., The, Chemical Div., 350 Madison Ave., New York 17, N. Y.
Ⓥ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
Ⓥ Paisley Products Inc., 1770 Canalport Ave., Chicago 16, Ill.
Ⓥ Plaskon Division, Libbey-Owens-Ford Glass Co., 2112-24 Sylvan Ave., Toledo 6, Ohio.
Ⓥ Reichhold Chemicals, Inc., 601-707 Woodward Heights Blvd., Detroit 20, Mich.
Ⓥ RICHARDSON CO., THE, 2767 Lake St., Melrose Park, Ill. ADV. PG. 144.

Vinyl Compounds

Ⓥ Bakelite Div., Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y.
Bamberger Corp., A., 44 Hewes St., Brooklyn 11, N. Y.
Ⓥ Borden Co., The, Chemical Div., 350 Madison Ave., New York 17, N. Y.
Ⓥ Dow Chemical Co., Midland, Mich.
Ⓥ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
Ⓥ Goodrich Chemical Co., B. F., Rose Bldg., Cleveland 15, Ohio.
Ⓥ Goodyear Tire & Rubber Co., Inc., Chemical Div., 1144 E. Market St., Akron 16, Ohio.
Ⓥ Marbon Corp., Gary, Indiana.
Ⓥ Monsanto Chemical Co., Plastics Div., Springfield 2, Mass.
Ⓥ Paisley Products Inc., 1770 Canalport Ave., Chicago 16, Ill.
Ⓥ Technical Supply Co., Radiocrafters, 1156 Commonwealth Ave., Boston 34, Mass.

PLATES—*Instruction*

Ⓥ Aircomark Co., The, 442 Morrell St., Elizabeth 4, N. J.
Austin Co., Inc., O., 335 Throop Ave., Brooklyn 21, N. Y.
Baer Co., N. S., 9 Montgomery St., Hillside, N. J.
Ⓥ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ Croname, Inc., 3701 Ravenswood Ave., Chicago, Ill.
Ⓥ Emeloid Co., Inc., The, 1239 Central Ave., Hillside 5, N. J.
Ⓥ Etched Products Corp., 39-01 Queens Blvd., Long Island City, N. Y.
Ⓥ Hopp Press Inc., 460 W. 34th St., New York, N. Y.
Insulating Fabricators Inc., 150 Union Ave., East Rutherford, N. J.
Ⓥ Insulating Fabricators of New England, Inc., 69 Grove St., Watertown 72, Mass.
Ⓥ MICA INSULATOR CO., Schenectady 1, N. Y. ADV. PG. 232.
Plastic Accessories, Inc., 93 Mercer St., New York 12, N. Y.
Plastic Fabricators Co., 440 Sansome Street, San Francisco 11, Calif.
Ⓥ Premier Metal Etching Co., 21-03 44th Ave., Long Island City, N. Y.

PLATES—*Name*

Ⓥ Aircomark Co., The, 442 Morrell St., Elizabeth 4, N. J.
Ⓥ American Emblem Co., Inc., P. O. Box 116P, Utica, N. Y.
Anathoner Exp., 104 Brookline Ave., Boston, Mass.
Ⓥ Art Reel Leaf Stamping Co., 3610 Palisade Ave., Union City, N. J.
Austin Co., Inc., O., 335 Throop Ave., Brooklyn 21, N. Y.
Ⓥ Baer Co., N. S., 9 Montgomery St., Hillside, N. J.
Ⓥ Brady Co., A. H., Dept. 33, 815 N. Third St., Milwaukee 3, Wis.
Ⓥ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.

1950-1951 DIRECTORY of

✓ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

✓Cromone, Inc., 3755 Ravenswood Ave., Chicago 13.
✓Imperial Inc., Inc., The, 1239 Central Ave., Hillside 7, N. J.
✓United Products Corp., 19-01 Queens Blvd., Long Island City, N. Y.
✓GENERAL ELECTRIC CO., Chemical Dept., Pittsfield, Mass. ADV. PG. 8 to 14.
✓Lea Molding Corp., 4600 W. Huron St., Chicago 44, Ill.
✓Lenzonner, A. Sons Inc., L. F., 504 Union St., Allentown 6, Pa.
✓Long Press Inc., 460 W. 34th St., New York, N. Y.
✓Lustrating Fabricators, Inc., 150 Union Ave., East Rutherford, N. J.
✓Lustrating Fabricators of New England, Inc., 69 Grove St., Watertown 72, Mass.
✓INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
✓Lustrous Fabricators, Inc., 4545 W. Cortland St., Chicago 39, Ill.
✓MICA INSULATOR CO., Greenpoint, L. I., N. Y. ADV. PG. 232.
✓Plastelite Div., St. Regis Paper Co., 230 Park Ave., New York, N. Y.
✓Plastelite Novelty Co., 1910 S. Western Ave., Chicago 8, Ill.
Plastic Accessories, Inc., 93 Mercer St., New York 12, N. Y.
Plastic Fabricators Co., 830 Sansome Street, San Francisco, Calif.
✓Plastikraft Products Co., 30 Hudson St., New York 13, N. Y.
✓Premier Metal Etching Co., 21-01 44th Ave., Long Island City, N. Y.
Printed Inc., 95 Mercer St., New York, N. Y.
Rowe Mfg. Co., Hagerstown, Md.
✓Shonnes Mfg. Co., 10 Porter Ave., W. So. Orange, N. J.
Spaulding Fibre Co., Inc., 310 Wheeler St., Tonawanda, N. Y.
✓U. S. Gauge Div., American Machine & Metals, Inc., Sellersville, Pa.
✓U. S. Radium Corp., 535 Pearl St., New York 7, N. Y.
✓Waterbury Companies, Inc., Waterbury 90, Conn.

PLATING—*Metal on Plastic*

Acme Co., The, 330 Throop Ave., Brooklyn 21, N. Y.
✓Lea Molding Corp., 4600 W. Huron St., Chicago 44, Ill.
✓Waterbury Companies, Inc., Waterbury 90, Conn.

PLATING—*Precision Metal*

✓COHAN EPNER Co., INC., 142 W. 14th St., New York 11, N. Y. ADV. PG. 254.
✓ELECTRO TEC CORP., 53 Bergen Turnpike, Little Ferry, N. J. ADV. PG. 198.
✓Metal Etching Co., Buffalo, N. Y.
✓Precision Power Wire Products Co., Detroit, Mich.
✓Swartz & Co., Chicago, Ill.

PLUGS—*Terminal*

✓AEROLITE ELECTRONIC HARDWARE CORP., 507 26th St., Union City, N. J. ADV. PG. 238.
✓ALDEN PRODUCTS CO., 117 No. Main St., Brockton 64, Mass. ADV. PG. 235.
✓Cannon Electric Development Co., 3209 Humboldt St., Los Angeles 31, Calif.
✓CINCH MFG. CORP., 1026 S. Homan Ave., Chicago 24, Ill. ADV. PG. 254.
✓Jones Products Co., 233 E. 134th St., New York 51, N. Y.
✓Connecticut Telephone & Electric Div., Great American Industries, Inc., 70 Britannia St., Meriden, Conn.
✓Fox, Inc., Hugh H., 4700 Stenton Ave., Phila. 44, Pa.
✓Ucinite Co., Div. of United-Carr Fastener Corp., 459 Watertown St., Newtonville, Mass.
✓Uniform Tubes, Union Lane & Larchdale St., Roxborough, Philadelphia, Pa.
✓U. S. Radium Corp., 535 Pearl St., New York 7, N. Y.
✓Waterbury Companies, Inc., Waterbury 90, Conn.
✓Winchester Electronics, Inc., Oakville, Conn. ADV. PG. 203.

PLUGS AND JACKS

✓AEROLITE ELECTRONIC HARDWARE CORP., 507 26th St., Union City, N. J. ADV. PG. 238.
✓ALDEN PRODUCTS CO., 117 No. Main St., Brockton 64, Mass. ADV. PG. 235.
✓Audio Development Co., 2833 13th Ave., Minneapolis 7, Minn.
✓Audio Equipment Sales, 153 W. 33rd St., New York 1, N. Y.
✓AVIOMETER DIV. OF ROANWELL CORP., 552 Fulton St., Brooklyn 17, N. Y. ADV. PG. 66.
✓Bliss Co., N. S., 9 Montgomery St., Hillside, N. J.
✓Birnbach Radio Co., Inc., 145 Hudson St., New York, N. Y.
✓Bud Radio Inc., 2118 E. 55th St., Cleveland 3, Ohio
✓Cannon Electric Development Co., 3209 Humboldt St., Los Angeles 31, Calif.
✓CINCH MFG. CORP., 1026 S. Homan Ave., Chicago 24, Ill. ADV. PG. 254.
✓Jones Products Co., 233 E. 134th St., New York 51, N. Y.
✓Connecticut Telephone & Electric Div., Great American Industries, Inc., 70 Britannia St., Meriden, Conn.
✓Fox, Inc., Hugh H., 4700 Stenton Ave., Phila. 44, Pa.
✓Ucinite Co., Div. of Electro-Connector Corp., 110 W. Oxford St., Philadelphia 22, Pa.
✓GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
✓GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 46, 47.
✓Lea Molding Corp., 4600 W. Huron St., Chicago 44, Ill.
✓Hallett Mfg. Co., 1401 Florence Ave., Inglewood, Calif.
✓INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
✓I. F. D. MFG. CO., 4301-23 Sixteenth Ave., Brooklyn, N. Y. ADV. PG. 254, 264.
✓Johnson, E. F., Waseca, Minn.
✓JONES DIV., HOWARD B., Cinch Mfg. Corp., 1026 S. Homan Ave., Chicago 24, Ill. ADV. PG. 254.
✓Kings Electronics Co., Inc., 413 Lexington Ave., Brooklyn 21, N. Y.
✓Linde Incorporated, P. O. Box 57, Baltimore 3, Md.
✓Local Electronics Corp., 744 E. 140th St., New York 54, N. Y.
✓Mallory & Co., Inc., P. R., 3029 E. Washington St., Indianapolis 6, Ind.
✓Minnesota Insulation Co., Amherst Business Div., 310 Price St., Philadelphia, Pa.
✓Morse Co., Frank W., 1900 Yankee Road Rd., Boston, Mass.
✓Multicore Mfg. Co., 115 University Place, New York 3, N. Y.
✓Plastiwold Corp., Attleboro, Mass.
✓Reeves-Ely Laboratories, Inc., 451 E. 124th St., New York 54, N. Y.
✓Rowan Co., Herman H., 405 44th St., Brooklyn 20, N. Y.
✓Standard Electric Time Co., 89 Logan St., Springfield, Mass.
✓Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
✓SWITCHCRAFT, INC., 1328-30 N. Halsted St., Chicago 22, Ill. ADV. PG. 267.
✓Telephonics Corp., Park Ave., Huntington, N. Y.
✓Ucinite Co., Div. of United-Carr Fastener Corp., 459 Watertown St., Newtonville, Mass.
✓Waters Corp., 7500 Huron River Drive, Dexter, Mich.
✓WINCHESTER ELECTRONICS, INC., Oakville, Conn. ADV. PG. 203.

POINTERS—*Dial*

✓AEROLITE ELECTRONIC HARDWARE CORP., 507 26th St., Union City, N. J. ADV. PG. 238.
✓Baldwin Locomotive Works, Philadelphia 42, Pa.
✓Birnbach Radio Co., Inc., 145 Hudson St., New York, N. Y.
✓Jones Products Co., 233 E. 134th St., New York 51, N. Y.
✓Kings Electronics Co., Inc., 413 Lexington Ave., Brooklyn 21, N. Y.
✓Lenzonner, A. Sons Inc., The, 1249 Central Ave., Hillside 7, N. J.
✓Lewyt Corp., 14-10 Astoria Ave., Elmhurst, N. Y.
✓GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
✓GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 9 to 18.
✓Lea Molding Corp., 4600 W. Huron St., Chicago 44, Ill.
✓Lenzonner, A. Sons Inc., L. F., 504 Union St., Allentown 6, Pa.
✓I. F. D. MFG. CO., 4301-23 Sixteenth Ave., Brooklyn, N. Y. ADV. PG. 254, 264.
✓Mallory & Co., Inc., P. R., 3029 E. Washington St., Indianapolis 6, Ind.
✓Mason Mfg. Co., James, 145 Exchange St., Malden, Mass.
✓Precision Novelty Co., 3520 South Western Ave., Chicago 9, Ill.
✓PATENT BUTTON CO. OF TENNESSEE, 2005 Century Blvd., Knoxville, Tenn. ADV. PG. 270.
✓Plastiwold Corp., Attleboro, Mass.
✓Smith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.
✓Ucinite Co., Div. of United-Carr Fastener Corp., 459 Watertown St., Newtonville, Mass.
✓Uniform Tubes, Union Lane & Larchdale St., Roxborough, Philadelphia, Pa.
✓U. S. Radium Corp., 535 Pearl St., New York 7, N. Y.
✓Waterbury Companies, Inc., Waterbury 90, Conn.
✓Waterbury Jewel Co., Lancaster, Pa.

Polonium

✓Canadian Radium & Uranium Corp., 630 Fifth Ave., New York 20, N. Y.
✓U. S. Radium Corp., 535 Pearl St., New York 7, N. Y.

POSTS—*Binding*

✓AEROLITE ELECTRONIC HARDWARE CORP., 507 26th St., Union City, N. J. ADV. PG. 238.
✓ALDEN PRODUCTS CO., 117 N. Main St., Brockton 64, Mass. ADV. PG. 235.
✓Berkshire Laboratories, P. O. Box 70, Concord, Mass.
✓BROWN ELECTRO-MEASUREMENT CORP., 4637 SE. Hawthorne Blvd., Portland 15, Oregon. ADV. PG. 276.
✓CAMBRIDGE THERMIONIC CORP., 445 Concord Ave., Cambridge, Mass. ADV. PG. 12.
✓CINCH MFG. CORP., 1026 S. Homan Ave., Chicago 24, Ill. ADV. PG. 254.
✓Jones Products Co., 233 E. 134th St., New York 51, N. Y.
✓Jule Instrument Co., 1420 S. Grand Ave., Los Angeles 15, Calif.
✓Eastern Specialty Co., Philadelphia 40, Pa.
✓Fox, Inc., Hugh H., 4700 Stenton Ave., Philadelphia 44, Pa.
✓FEDERAL SCREW PRODUCTS INC., 224 W. Huron St., Chicago 10, Ill. ADV. PG. 271.
✓Franklin Mfg. Corp., A. W., 43-20 34th St., Long Island City, N. Y.
✓GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 46, 47.
✓Insulation Mfg. Co., 11 New York Ave., Brooklyn, N. Y.
✓INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
✓MALCO TOOL & MFG. CO., 4025 W. Lake St., Chicago 24, Ill. ADV. PG. 334.
✓NATIONAL CO., INC., 61 Sherman St., Malden 48, Mass. ADV. PG. 15 to 86.
✓Pollenex Mfg. Co., 115 University Place, New York 3, N. Y.
✓Rowan, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.
✓Stanley Co., 19 New Park Ave., Hartford 6, Conn.
✓Stronghold Screw Products Inc., 216-222 W. Hubbard St., Chicago 10, Ill.
✓SUPERIOR ELECTRIC CO., THE, 61 Meadow St., Bristol, Conn. ADV. PG. 110, 111.
✓WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

POTENTIOMETERS

✓Allen-Bradley Co., 136 W. Greenfield Ave., Milwaukee 4, Wis.
✓Amalgamated Electronics, Electronic Road, Clinton Corners, N. Y.
✓BROWN ELECTRO-MEASUREMENT CORP., 4637 SE. Hawthorne Blvd., Portland 15, Oregon. ADV. PG. 276.
✓CENTRALAB, DIV. GLOBE UNION INC., 900 E. Keefe Ave., Milwaukee 1, Wis. ADV. PG. 64, 65.
✓CINEMA ENGINEERING CO., 1510 N. Verdugo Ave., Burbank, Calif. ADV. PG. 184.
✓CLAROSTAT MFG. CO., INC., Dover, N. H. ADV. PG. 227.
✓Daven Co., 191 Central Ave., Newark 4, N. J.
✓DEJUR-AMSCO CORP., Northern Blvd. at 45th St., Long Island City 1, N. Y. ADV. PG. 269.
✓Gerrard, The Upper Newton Falls 64, Mass.
✓GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 9 to 18.
✓GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 46, 47.
✓Geophysical Instrument Co., 1820 N. Nash St., Arlington, Va.
✓HELIPOT CORP., 916 Meridian Ave., South Pasadena, Calif. ADV. PG. 191.
✓INTERNATIONAL RESISTANCE CO., 401 N. Broad St., Philadelphia 8, Pa. ADV. PG. 88, 89.
✓Mallory & Co., Inc., P. R., 3029 E. Washington St., Indianapolis 6, Ind.
✓MUIRHEAD & CO., INC., Beckenham, Kent, England. ADV. PG. 51.
✓North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
✓OHMITE MFG. CO., 4835 W. Flournoy St., Chicago 44, Ill. ADV. PG. 83.
✓Precision Electronic Components, Regd., P. O. Box 164, Granby, Quebec, Canada.
✓Radiron Co., 1751 Ridge Ave., Philadelphia, Pa.
✓Smoother & Co., Inc., A. F., 202 Tillary St., Brooklyn 1, N. Y.
✓SOUND APPARATUS CO., Sterling, N. J. ADV. PG. 249.

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

Ⓥ STACKPOLE CARBON CO., St. Marys, Pa. ADV. PG. 156, 167.
Ⓥ Tech Laboratories, Inc., Bergen & Edsall Blvds., Palisades Park, N. J.
Ⓥ Technology Instrument Corp., 1058 Main St., Waltham 54, Mass.
Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

POTENTIOMETERS—*Linear & Non Linear Precision Wire Wound*

Ⓥ Amalgamated Electronics Electronics Road, Clinton Corners, N. Y.
Ⓥ BROWN ELECTRO-MEASUREMENT CORP., 4637 S. E. Hawthorne Blvd., Portland 15, Ore. ADV. Pg. 276.
Ⓥ CENTRALAB, DIV. GLOBE UNION INC., 900 E. Keefe Ave., Milwaukee 1, Wis. ADV. PG. 64, 65.
Ⓥ CINEMA ENGINEERING CO., 1510 W. Verdugo Ave., Burbank, Calif. ADV. PG. 186.
Ⓥ CLAROSTAT MFG. CO., INC., Dover, N. H. ADV. PG. 227.
Ⓥ Cook Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ Daven Co., 191 Central Ave., Newark 4, N. J.
Ⓥ DE JUR-AMSCO CORP., Northern Blvd., at 45th St., Long Island City 1, N. Y. ADV. PG. 267.
Ⓥ Electronic Associates, Inc., Long Branch, N. J.
Ⓥ Fairchild Camera & Instrument Corp., 88-06 Van Wyck Blvd., Jamaica 1, N. Y.
Ⓥ Ford Engineering Co., 2738 Colorado Blvd., Los Angeles 41, Calif.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Ⓥ GIBBS DIVISION, GEORGE W. BORG CORP., Delavan, Wis. ADV. PG. 198, 199.
Ⓥ HELIPOT CORP., 916 Meridian Ave., S. Pasadena, Calif. ADV. PG. 89.
Ⓥ INTERNATIONAL RESISTANCE CO., 401 N. Broad St., Philadelphia 8, Pa. ADV. PG. 68, 69.
Jarvis Electronics Corp., 6058 W. Fullerton Ave., Chicago 39, Ill.
Mayer Co., 1256 S. Michigan Ave., Chicago, Ill.
Ⓥ RAWSON ELECTRICAL INSTRUMENT CO., 111 Potter St., Cambridge 42, Mass. ADV. PG. 154.
Ⓥ Reeves Instrument Corp., 215 E. 91st St., New York, N. Y.
Ⓥ Tech Laboratories, Inc., Bergen & Edsall Blvds., Palisades Park, N. J.
Ⓥ Technology Instrument Corp., 1058 Main St., Waltham 54, Mass.

POTENTIOMETERS—*Portable Instrument*

Ⓥ Associated Research, Inc., 5758 W. Belmont, Chicago 34, Ill.
Ⓥ BROWN ELECTRO-MEASUREMENT CORP., 4637 SE Hawthorne Blvd., Portland 15, Ore. ADV. PG. 276.
Ⓥ CENTRALAB, DIV. GLOBE UNION INC., 900 E. Keefe Ave., Milwaukee 1, Wis. ADV. PG. 64, 65.
Ⓥ CLAROSTAT MFG. CO., INC., Dover, N. H. ADV. PG. 227.
Ⓥ Cook Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ Fisher Scientific Co., 717 Forbes St., Pittsburgh 19, Pa.
Ⓥ Kinzbro Co., The, Kingston, Mass.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Geophysical Instrument Co., 1870 N. Sixth St., Arlington, Va.
Ⓥ Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
Ⓥ Radion Co., 3761 Ridge Ave., Philadelphia, Pa.
Ⓥ Sensitive Research Instrument Corp., 9 Elm Ave., Mt. Vernon, N. Y.
Ⓥ Tech Laboratories, Inc., Bergen & Edsall Blvds., Palisades Park, N. J.
Ⓥ Weston Scientific Co., W. M., 1515 Setzwick St., Chicago 10, Ill.
Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.
Ⓥ Wilkins Instruments Corp., 837 W. Harrison St., Chicago 7, Ill.

POTS—*Soldering*

Ⓥ Acme Electric Heating Co., 1217 Washington St., Boston, Mass.
Ⓥ ELECTRIC SOLDERING IRON CO., W. Elm St., Deep River, Conn. ADV. PG. 186.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ KAHLE ENGINEERING CO., 1307 7th St., North Bergen, N. J. ADV. PG. 180, 181.
Ⓥ Kellogg Switchboard & Supply Co., 6650 S. Cicero Ave., Chicago 38, Ill.
Ⓥ Stelle Engineering & Mfg. Co., 3920 S. Grand Ave., Los Angeles 37, Calif.
Ⓥ Tech Laboratories, Inc., Bergen and Edsall Blvds., Palisades Park, N. J.
Ⓥ Wassell Electric Inc., 54 Park Place, New York 7, N. Y.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

POTS AND TANKS—*Heating*

Ⓥ Acme Electric Heating Co., 1217 Washington St., Boston, Mass.
Ⓥ Aerol Products Co., Inc., Wesley St., South Hackensack, N. J.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Lukens Steel Co. and Divisions, By-Products Steel Co. & Lukenweld, 447 Lukens Bldg., Coatesville, Pa.
Ⓥ Sta-Warm Electric Co., Ravenna, Ohio.
Ⓥ Wasse Electric Inc., 54 Park Pl., New York 7, N. Y.

POWDERS—*Magnetic*

Ⓥ Arnold Engineering Co., 147 E. Ontario St., Chicago 11, Ill.
Ⓥ Carson Mfg. Co., 415 S. Aberdeen St., Chicago 7, Ill.
Ⓥ Plastic Metals Division, The National Radiator Co., 149 Bridge St., Jamestown, Pa.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W.C. 2, England.
Ⓥ WILLIAMS & CO., C. K., 2001 Lynch Ave., East St. Louis, Mo. ADV. PG. 148.

POWDERS—*Polishing*

Ⓥ Linde Chemical Co., 20 E. Madison St., Chicago 2, Ill.
Ⓥ Norton Co., 1 New Bond St., Worcester 6, Mass.
Ⓥ Riverson & Son, Inc., J. T., Box 8002-A, Chicago, Ill.
Ⓥ WILLIAMS & CO., C. K., 2001 Lynch Ave., East St. Louis, Mo. ADV. PG. 148.

POWER SUPPLIES

Ⓥ Air Associates, Inc., Teterboro, N. J.
Ⓥ AIRPAX PRODUCTS CO., 1024 Greenmount Ave., Baltimore 2, Md. ADV. PG. 275.
Ⓥ Altec Lansing Corp., 161 Avenue of the Americas, New York 13, N. Y.
Ⓥ American Electroneering Co., 2112 S. La Brea Ave., Los Angeles, Calif.
Ⓥ AMERICAN TELEVISION & RADIO CO., 300 E. Fourth St., St. Paul 1, Minn. ADV. PG. 275.
Ⓥ ATOMIC INSTRUMENT CO., 160 Charles St., Boston, Mass. ADV. PG. 216.
Ⓥ Audio Equipment Sales, 153 W. 33rd St., New York 1, N. Y.
Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ BETA ELECTRIC CORP., 1762 3rd Ave., New York 29, N. Y. ADV. PG. 171.
Ⓥ Bouck Co., Arthur E., 4134 Beverly Blvd., Los Angeles 4, Calif.
Burnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ Carrier & Bitter, 2332 Ontario Rd., N.W., Washington 9, D. C.
Ⓥ Collins Audio Products Co., P. O. Box 368, Westfield, N. J.
Ⓥ Collins Radio Co., Cedar Rapids, Iowa.
Ⓥ Communication Measurements Lab., 120 Greenwich St., New York, N. Y.
Ⓥ CORNELL-DUBILIER ELECTRIC CORP., South Plainfield, N. J. ADV. PG. 70.
Electrical Transformer Co., Westerly Rd., Ossining, N. Y.
Ⓥ Electro Products Labs., Inc., 549 W. Randolph St., Chicago 6, Ill.
Ⓥ Electronic Engineering Corp., 624 Ridge Rd., Lyndhurst, N. J.
Ⓥ ELECTRONICS INC., 2649 N. Howard St., Philadelphia 33, Pa. ADV. PG. 238.
Electronic Controls Co., of New York, 3124 Avenue I, Brooklyn 10, N. Y.
Ⓥ ESPEY ELECTRONIC CORP., DAWKINS, 11747 W. Pico Blvd., Los Angeles 34, Calif. ADV. PG. 105.
Ⓥ Fairchild Recording Equipment Corp., 154th St. and 7th Ave., Whitestone, N. Y.
Ⓥ Fansteel Metallurgical Corp., 2200 Sheridan Rd., Nicago, Ill.
Ⓥ FEDERAL TELEPHONE AND RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 33 to 35.
Ⓥ FREED TRANSFORMER CO., INC., 1726 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 143.
Ⓥ Furst Electronics, 10A S. Jefferson St., Chicago 6, Ill.
Ⓥ Gates Radio Co., Quincy, Ill.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 46, 49.
Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Ⓥ HARVEY RADIO LABS., INC., 447 Concord Ave., Cambridge, Mass. ADV. PG. 194.
Ⓥ Heiland Instrument Co., Box 1275, Hampton, Va.
Ⓥ HEATH CO., Benton Harbor, Mich. ADV. PG. 279.
Ⓥ HIGHLAND ENGINEERING CO., 52 Holman Blvd., Hicksville, N. Y. ADV. PG. 194.
Hinsdale Laboratories, 734 Hamilton Ave., Menlo Park, Calif.
Ⓥ INDUCTOGRAPH PRODUCTS, 236 W. 55th St., New York, N. Y. ADV. PG. 234.
Ⓥ James Vibrapower Co., 3224 Armitage Ave., Chicago 47, Ill.
Ⓥ K-V Transformer Corp., 4414 Park Ave., New York 54, N. Y.
Ⓥ Kaar Engineering Co., 2995 Middlefield Rd., Palo Alto, Calif.
Ⓥ KEPCO LABS., INC., 149-14 41st Ave., Flushing, N. Y. ADV. PG. 150.
Ⓥ Langevin Mfg. Corp., 37 W. 65th St., New York 23, N. Y.
Lectronic Research Labs., 1021 Callowhill St., Philadelphia 23, Pa.
Ⓥ Lenkurt Electric Co., Inc., San Carlos, Calif.
Ⓥ Lenmar Engineers, Inc., 1721 Delancey St., Philadelphia 3, Pa.
Ⓥ McColpin-Christie Corp., 4922 S. Figueroa St., Los Angeles 37, Calif.
Ⓥ Magnetic Instrument Co., 82 W. Main St., West Orange, N. J.
Ⓥ Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.
Ⓥ Minnesota Electronics Corp., The, 97 E. Fifth St., St. Paul 1, Minn.
Ⓥ MODEL RECTIFIER CORP., 1510 Nostrand Ave., Brooklyn 26, N. Y. ADV. PG. 275.
Ⓥ NATIONAL CO., INC., 61 Sherman St., Malden 48, Mass. ADV. PG. 51 to 56.
Ⓥ Newcomb Audio Products Co., 6824 Lexington Ave., Hollywood 38, Calif.
Ⓥ Nucleonic Corp. of America, The, 492 Union St., Brooklyn 31, N. Y.
Ⓥ OPAD-GREEN CO., 71 Warren St., New York 7, N. Y. ADV. PG. 270.
Ⓥ OREGON ELECTRONIC MFG. CO., 206 S. W. Washington St., Portland 4, Ore. ADV. PG. 205.
Ⓥ Osborne Transformer Corp., 948 E. Lafayette Ave., Detroit 7, Mich.
Ⓥ Polarad Electronics Corp., 100 Metropolitan Ave., Brooklyn 11, N. Y.
Ⓥ POLYTECHNIC RESEARCH & DEVELOPMENT CO., INC., 202 Tillary St., Brooklyn 1, N. Y. ADV. PG. 56, 57.
Ⓥ Power Equipment Co., 55 Antoinette St., Detroit 2, Mich.
Ⓥ Press Wireless Mfg. Co., Inc., Cantiague Rd., Hicksville, L. I., N. Y.
Ⓥ Radiart Corp., The, 3571 W. 62nd St., Cleveland 2, Ohio.
Ⓥ RAYTHEON MFG. CO., Power Tube Div., Waltham 54, Mass. ADV. PG. 257.
Ⓥ Schauer Mfg. Corp., 2119 Reading Rd., Cincinnati 2, Ohio.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Smucker & Co., Inc., A. F., 202 Tillary St., Brooklyn 1, N. Y.
Ⓥ SORENSEN & CO., INC., 375 Fairfield Ave., Stamford, Conn. ADV. PG. 141.
Ⓥ SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.
Ⓥ STANDARD TRANSFORMER CORP., Elston, Kedzie and Addison, Chicago 18, Ill. ADV. PG. 62.
Stephens Mfg. Corp., 8538 Warner Drive, Culver City, Calif.
Telemark Electronics Corp., 150 Broadway, New York, N. Y.
Tinnerup Radio Co., 1901 S. Washtenaw, Chicago, Ill.
Ⓥ Thor Electric & Machine Works, 15 S. Jefferson St., Chicago, Ill.
Ⓥ Thordarson Electric Mfg. Div., Maguire Industries, Inc., 500 W. Huron St., Chicago 10, Ill.
Ⓥ Varo Mfg. Co., Inc., Box 630, Garland, Tex.
Ⓥ Wilcox Electric Co., 1400 Chestnut St., Kansas City, Mo.

POWER SUPPLIES—*High Voltage*

Ⓥ Altec Lansing Corp., 161 Avenue of the Americas, New York 13, N. Y.
Ⓥ American Electroneering Co., 2112 S. La Brea Ave., Los Angeles, Calif.
Ⓥ AMERICAN TELEVISION & RADIO CO., 300 E. Fourth St., St. Paul 1, Minn. ADV. PG. 275.
Ⓥ ATOMIC INSTRUMENT CO., 160 Charles St., Boston, Mass. ADV. PG. 216.
Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ BETA ELECTRIC CORP., 1762 3rd Ave., New York 29, N. Y. ADV. PG. 171.
Ⓥ Carrier & Bitter, 2332 Ontario Rd., NW, Washington 9, D. C.
Cascade Television Co., 179 South St., Newark, N. J.
Ⓥ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ Collins Radio Co., Cedar Rapids, Iowa.
Ⓥ CONDENSER PRODUCTS CO., 1375 N. Branch St., Chicago 22, Ill. ADV. PG. 213.
Ⓥ Cossor (Canada) Ltd., 301-303 Windsor St., Halifax, N. S., Canada.
Electrical Transformer Co., Westerly Rd., Ossining, N. Y.
Electronic Brazing Co., 146 Glenridge Ave., Montclair, N. J.
Ⓥ Electronic Engineering Corp., 624 Ridge Rd., Lyndhurst, N. J.
Ⓥ ELECTRONIC MEASUREMENTS CO., Red Bank, N. J. ADV. PG. 139.
Elyon, Inc., 407 N. Jackson St., Jackson, Mich.
Ⓥ EL-TRONICS INC., 2649 N. Howard St., Philadelphia 33, Pa. ADV. PG. 238.
Ⓥ Emphasis Engineering Corp., 224 E. 204th St., New York 58, N. Y.

V indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

V ESPY ELECTRONIC CORP., DAWKINS, 11747 W. Pico Blvd., Los Angeles 64, Calif. ADV. PG. 255.
Fluke Electronics, Berkeley Heights, N. J.
V FEDERAL TELEPHONE & RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.
V FERRANTI ELECTRIC, INC., 30 Rockefeller Plaza, New York 20, N. Y. ADV. PG. 81.
V Fluke Engineering Co., John, Box 755, Springdale, Conn.
V FREED TRANSFORMER CO., INC., 1736 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 143.
V Furst Electronics, 10A S. Jefferson St., Chicago 6, Ill.
V Gates Radio Co., Quincy, Ill.
V GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
V GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
V HARVEY RADIO LABS., Inc., 441 Concord Ave., Cambridge, Mass. ADV. PG. 104.
V Inductograph Laboratory, Box 76, Brookfield, Conn.
V INDUCTOGRAPH PRODUCTS, 236 W. 55th St., New York, N. Y. ADV. PG. 254.
V J. V. Transformer Corp., 4414 Park Ave., New York 57, N. Y.
V KEPCO LABS., INC., 149-14 41st Ave., Flushing, N. Y. ADV. PG. 150.
V Milgen Mfg. Co., James, 150 Exchange St., Malden, Mass.
V MODEL RECTIFIER CORP., 1510 Nostrand Ave., Brooklyn, N. Y. ADV. PG. 273.
V Moulic Specialties Co., 1005-1007 W. Washington St., Bloomington, Ill.
V Nucleonic Corp. of America, The, 497 Union St., Brooklyn 31, N. Y.
V Polarad Electronics Corp., 100 Metropolitan Ave., Brooklyn 11, N. Y.
V POLYTECHNIC RESEARCH & DEVELOPMENT CO., INC., 202 Tillary St., Brooklyn 1, N. Y. ADV. PG. 57.
V Press Wireless Mfg. Co., Inc., Carthage Rd., Hicksville, L. I., N. Y.
V Radioactive Products, Inc., 3201 E. Woodbridge St., Detroit 7, Mich.
V RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
V SPELLMAN TELEVISION CO., INC., 3029 Webster Ave., New York 11, N. Y. ADV. PG. 164.
V SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.
Tremark Electronics Corp., 150 Broadway, New York, N. Y.
V Tektronics Laboratory, Inc., 352 Marie Ave., West, Inwood, L. I., N. Y.
V Thordarson Electric Mfg. Div., Magnavox Industries, Inc., 500 W. Huron St., Chicago 10, Ill.
V Varian Associates, 99 Washington St., San Carlos, Calif.

POWER SUPPLIES—*Regulated*

V Altec Lansing Corp., 161 Avenue of the Americas, New York 13, N. Y.
American Electronic Technology Inc., 61 Park Ave., New York 16, N. Y.
V American Electronics Inc., 8117 S. La Brea Ave., Los Angeles, Calif.
V AMERICAN TELEVISION & RADIO CO., 300 E. 4th Street, St. Paul 1, Minn. ADV. PG. 255.
V Associated Corp. of America, 346 Broadway, New York, N. Y.
V ATOMIC INSTRUMENT CO., 160 Charles St., Boston, Mass. ADV. PG. 218.
V Audio Equipment Sales, 154 W. 14th St., New York 1, N. Y.
V BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
V BETA ELECTRIC CORP., 1762 3rd Ave., New York, N. Y. ADV. PG. 162.
V BROWNING LABORATORIES, INC., 750 Main St., Winchester, Mass. ADV. PG. 30.
V C G S LABORATORIES, INC., 36 Linden St., Stamford, Conn. ADV. PG. 244.
V Cannon & Bitter, 2332 Decatur Rd. NW, Washington 16, D. C.
Carbon Television Co., 179 South St., Newark, N. J.
V CHATHAM ELECTRONICS CORP., 475 Washington St., Newark 2, N. J. ADV. PG. 136.
V Cinx Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
V Communication Measurements Lab., Inc., 170 Green St., New York, N. Y.
V CORNELL DUBILIER ELECTRIC CORP., South Plainfield, N. J. ADV. PG. 50.
V Dressler Industrial Ltd., 301-303 Windsor St., Halifax, N. S., Canada
Douglas Radio Labs., 40 Wayland St., Boston 24, Mass.
Electric Equipment Corp., 917 Meridian Ave., South Pasadena, Calif.
V Electronic Engineering Corp., 624 Ridge Rd., Lyndhurst, N. J.
V ELECTRONIC MEASUREMENTS CO., Red Bank, N. J. ADV. PG. 249.
V ELECTRONICS, INC., 2642 N. Howard St., Philadelphia 33, Pa. ADV. PG. 238.
V ESPY ELECTRONIC CORP., DAWKINS, 11747 W. Pico Blvd., Los Angeles 64, Calif. ADV. PG. 255.
V Fansteel Metallurgical Corp., 2200 Sheridan Rd., Chicago, Ill.
V FEDERAL TELEPHONE AND RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.
V FERRANTI ELECTRIC, INC., 30 Rockefeller Plaza, New York 20, N. Y. ADV. PG. 81.
V Fluke Engineering Co., John, Box 755, Springdale, Conn.
V Furst Electronics, 10A S. Jefferson St., Chicago 6, Ill.
V Gates Radio Co., Quincy, Ill.
V GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
V GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
V HARVEY RADIO LABS., INC., 447 Concord Ave., Cambridge, Mass. ADV. PG. 104.
V Hastings Instrument Co., Box 1275, Hampton, Va.
V Howard Co., The, 944 Dreer Rd., Dreer Hill, Pa.
V INDUCTOGRAPH PRODUCTS, 236 W. 55th St., New York, N. Y. ADV. PG. 254.
V INDUSTRIAL ELECTRONICS, INC., 2457 Woodward Ave., Detroit 1, Mich. ADV. PG. 255.
V KEPCO LABS., INC., 149-14 41st Ave., Flushing, N. Y. ADV. PG. 150.
V LAMBDA ELECTRONICS CORP., 103-02 Northern Blvd., Corona, N. Y. ADV. PG. 268.
MacLeod & Hanopol, 10 Joiner St., Charlestown 29, Mass.
V Magnetic Instrument Co., 82 W. Main St., West Orange, N. J.
V Milgen Mfg. Co., James, 150 Exchange St., Malden, Mass.
V Miller Corp., Jno., 162 W. Colorado St., Pasadena, Calif.
V Moulic Specialties Co., 1005-1007 W. Washington St., Bloomington, Ill.
V Nucleonic Corp. of America, The, 497 Union St., Brooklyn 31, N. Y.
V OREGON ELECTRONIC MFG. CO., 206 S. 20 Washington St., Portland 4, Ore. ADV. PG. 215.
V Philbrick Associates, Inc., George A., 230 Congress St., Boston 10, Mass.
V Polarad Electronics Corp., 100 Metropolitan Ave., Brooklyn 11, N. Y.
V POLYTECHNIC RESEARCH & DEVELOPMENT CO., INC., 202 Tillary St., Brooklyn 1, N. Y. ADV. PG. 57.
V Power Equipment Co., 65 Antoinette St., Detroit 2, Mich.
V Press Wireless Mfg. Co., Inc., Carthage Rd., Hicksville, L. I., N. Y.
Process & Instruments, 46 Greenpoint Ave., Brooklyn 22, N. Y.
V Radioactive Products, Inc., 3201 E. Woodbridge St., Detroit 7, Mich.
V RADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 76 Inside Back and Back Covers.
V RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
Richardson Allen Corp., 10 W. 20th St., New York 11, N. Y.
V Servomechanisms, Inc., 142 Mineola Blvd., Mineola, N. Y.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Smoaker & Co., Inc., A. F., 202 Tillary St., Brooklyn 1, N. Y.
V SORENSON & CO., INC., 375 Fairfield Ave., Stamford, Conn. ADV. PG. 151.
V SPELLMAN TELEVISION CO., INC., 3029 Webster Ave., New York 11, N. Y. ADV. PG. 164.
V SPENCER-KENNEDY LABS., INC., 186 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 246.
V SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.
V Stancil-Hoffman Corp., 1016 N. Highland Ave., Hollywood 38, Calif.
V SUPERIOR ELECTRIC CO., 83 Meadow St., Bristol, Conn. ADV. PG. 110, 111.
Tremark Electronics Corp., 150 Broadway, New York, N. Y.
V Tektronics Laboratory, Inc., 352 Marie Ave., West-bury, L. I., N. Y.
V Thor Electric & Machine Works, 15 S. Jefferson St., Chicago, Ill.
V Thordarson Electric Mfg. Div., Magnavox Industries, Inc., 500 W. Huron St., Chicago 10, Ill.
V Varian Associates, 99 Washington St., San Carlos, Calif.
V Vvarn Mfg. Co., Inc., Box 638, Garland, Texas.

PRE-AMPLIFIERS for COMMUNICATION RECEIVERS

V American Communications Corp., 306 Broadway, New York 7, N. Y.
V BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
V Dorlimeter, Inc., 1430 Market St., Denver 2, Colorado
V Gates Radio Co., Quincy, Ill.
Gonset Co., 72 E. Tujunga Ave., Burbank, Calif.
V Kear Engineering Co., 2995 Middlefield Rd., Palo Alto, Calif.
V Lysmar Engineers, Inc., 1721 Delanes St., Philadelphia 3, Pa.
V Milgen Mfg. Co., James, 150 Exchange St., Malden, Mass.
V NORTHERN RADIO CO., INC., 143-145 W. 22nd St., New York 11, N. Y. ADV. PG. 132, 133.
Radio Mfg. Engineers Inc., 300-302 First Ave., Peoria 6, Ill.
V RAYTHEON MFG. CO., Power Tube Div., Waltham 54, Mass. ADV. PG. 257.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Z & W Machine Products Inc., Electronics Div., 5151 St. Clair Ave., Cleveland 3, Ohio.

PRE-SELECTORS

V Air Associates, Inc., Teterboro, N. J.
V BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Gonset Co., 72 E. Tujunga Ave., Burbank, Calif.
V Maryland Electronic Mfg. Corp., 5009 Calvert Rd., College Park, Md.
V Milgen Mfg. Co., James, 150 Exchange St., Malden, Mass.
V Polarad Electronics Corp., 100 Metropolitan Ave., Brooklyn 11, N. Y.
Radio Mfg. Engineers Inc., 300-302 First Ave., Peoria 6, Ill.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.

PRESSES—*Hydraulic Molding*

V Hydraulic Press Mfg. Co., Mt. Gilead, Ohio
V Pacific Metal Co., Inc., 4th Ave. & Cedar Ave., Pitman, N. J.
Short Wave Plastic Forming Co., 2921 W. Almeda St., Burbank, Calif.
V Stokes Machine Co., F. J., 5650 Tabor Rd., Olney P. O., Philadelphia 20, Pa.

PRINTED OR STAMPED CIRCUITS

See Circuits

PROBES

V AEROLITE ELECTRONIC HARDWARE CORP., 102 24th St., Union City, N. J. ADV. PG. 138.
V Commercial Radio Sound Corp., 575 Lexington Ave., New York 22, N. Y.
V ELECTRONIC DESIGNS, INC., Irvington, N. Y. ADV. PG. 199.
V GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
V HEATH CO., Benton Harbor, Mich. ADV. PG. 279.
V INSULINE CORP. OF AMERICA, 30-02 39th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
V Keystone Electronics Co., 30-52 Franklin St., New York 13, N. Y.
V MILLIVAC INSTRUMENTS, Box 3027, New Haven, Conn. ADV. PG. 182.
V Nuclear Instrument & Chemical Corp., 223 W. Erie St., Chicago 10, Ill.
V RADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 76 Inside Back and Back Covers.
V RADIO FREQUENCY LABS., Inc., Boonton, N. J. ADV. PG. 172.
V Ramey, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.
V SPENCER-KENNEDY LABS., INC., 186 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 246.
V SYLVANIA ELECTRIC PRODUCTS, INC., Emporium, Pa. ADV. PG. 236 to 239.
V United Technical Labs., Box 625 W., Morristown, N. J.
V WATERMAN PRODUCTS CO., INC., 2448-63 Emerald St., Philadelphia 25, Pa. ADV. PG. 252.

PRODUCTION TUBE TESTING EQUIPMENT

V BUCK ENGINEERING CO., INC., 31-41 Mercy St., Freehold, N. J. ADV. PG. 194.
V Cinx Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
V Electronic Engineering Corp., 624 Ridge Rd., Lyndhurst, N. J.
MacLeod & Hanopol, 10 Joiner St., Charlestown 29, Mass.
V PANORAMIC RADIO PRODUCTS, INC., 10 South Second Ave., Mt. Vernon, N. Y. ADV. PG. 270.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Sierra Electronic Corp., San Carlos, Calif.

PROJECTION TUBES

See Tubes, Television Projection

PROTECTIVE SEALERS

See Insulating Compounds

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

PSYCHOGALVANOMETERS

Ⓥ Associated Research, Inc., 3758 W. Belmont, Chicago 18, Ill.
Ⓥ Electro-Medical Lab., Inc., Holliston, Mass.

PUBLIC ADDRESS SYSTEMS

See Sound Systems, Complete

PULLERS—*Radio Tube*

Ⓥ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
Ⓥ INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
Ⓥ Schott Co., Walter L., 9306 Santa Monica Blvd., Beverly Hills, Calif.

PULLEYS—*Dial*

Ⓥ AMERICAN MOLDED PRODUCTS CO., 1644 N. Honore St., Chicago 22, Ill. ADV. PG. 263.
Brandywine Fibre Co., 15th & Poplar Sts., Wilmington, Del.
Ⓥ FEDERAL SCREW PRODUCTS INC., 224 W. Huron St., Chicago 10, Ill. ADV. PG. 271.
Ⓥ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
Ⓥ INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
Ⓥ Smith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.

PUNCHES—*Metal*

Eyelet Tool Co., 188 Dorchester Ave., Boston, Mass.
Ⓥ Greene Mfg. Corp., G. G., Warren, Pa.
Ⓥ Industrial Precision Products Co., 315-325 N. Hoyne Ave., Chicago 12, Ill.
Ⓥ INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
Ⓥ Snell-Irwin Mfg. Co., 316 8th Ave., Lake City, Minn.
Ⓥ Westinghouse Machine Co., 4272 Wissahickon Ave., Philadelphia 32, Pa.

PUSHBUTTONS

Ⓥ Allen-Bradley Co., 136 W. Greenfield Ave., Milwaukee 4, Wis.
Ⓥ Catalin Corp. of America, 1 Park Ave., New York 16, N. Y.
Ⓥ Clark Controller Co., 1146 E. 152nd St., Cleveland 10, Ohio.
Ⓥ Cutler-Hammer, Inc., 411 No. 12th St., Milwaukee 1, Wis.
Ⓥ Emerald Co., Inc., The, 1239 Central Ave., Hillside 5, N. J.
Ⓥ Federal Electric Products Co., 50 Paris St., Newark, N. J.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
Reisner Mfg. Co., Hagerstown, Md.
Ⓥ RUSSELL & STOLL CO., INC., 125 Barclay St., New York 7, N. Y. ADV. PG. 211.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 27.

PYROMETERS AND POTENTIOMETER PYROMETERS

Ⓥ Assembly Products, Inc., Chagrin Falls 6, Ohio.
Ⓥ Bailey Meter Co., 1044 Ivanhoe Rd., Cleveland 10, Ohio.
Ⓥ Beede Electrical Instrument Co., Inc., Penacook, N. H.
Ⓥ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ Foxboro Co., The, Foxboro, Mass.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Harshaw Scientific Div. of The Harshaw Chemical Co., 1945 E. 97th St., Cleveland 6, Ohio.
Ⓥ Illinois Testing Labs. Inc., 420 N. La Salle St., Chicago 10, Ill.
Ⓥ J B T INSTRUMENTS, INC., 441 Chapel St., New Haven 8, Conn. ADV. PG. 261.
Ⓥ Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
Ⓥ Lewis Engineering Co., 52 Rubber Ave., Naugatuck, Conn.
Ⓥ Meters, Inc., 915 Westfield Blvd., Indianapolis 20, Ind.
Ⓥ Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne and Roberts Aves., Philadelphia 44, Pa.
Nurnberg Thermometer Co., Inc., 4 Corey St., Boston 32, Mass.
Ⓥ Richards Co., Inc., Arklay S., 78 Winchester St., Newton Highlands 61, Mass.
Ⓥ Rubicon Co., 3751 Ridge Ave., Philadelphia, Pa.
Ⓥ Thwing-Albert Instrument Co., 5351 Pulaski Ave., Philadelphia 44, Pa.
Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.
Ⓥ Wheelco Instruments Co., 847 W. Harrison St., Chicago 7, Ill.

QUARTZ—*Raw*

Ⓥ Breon Laboratories, 1520 Evergreen Rd., Williamsport, Pa.
Ⓥ Crystal Research Labs., Inc., 29 Allyn St., Hartford, Conn.
Dallons Labs., 5066 Santa Monica Blvd., Los Angeles, Calif.
Diamond Drill Carbon Co., 53-63 Park Row, New York 7, N. Y.
Ⓥ KNIGHTS CO., JAMES, 131 S. Wells St., Sandwich, Ill. ADV. PG. 190.
Monitor Products Co., 915 Fremont Ave., So. Pasadena, Calif.

QUARTZ—*Unfinished Crystals*

Ⓥ BLILEY ELECTRIC CO., Union Station Bldg., Erie, Pa. ADV. PG. 136.
Ⓥ Brein Laboratories, 1520 Evergreen Rd., Williamsport, Pa.
Ⓥ CLARK CRYSTAL CO., 2 Farm Rd., Marlboro, Mass. ADV. PG. 210.
Ⓥ Crystal Research Labs., Inc., 29 Allyn St., Hartford, Conn.
Ⓥ Eidson Electronic Co., 1802 N. Third St., Temple, Texas.
Ⓥ KNIGHTS CO., JAMES, 131 S. Wells St., Sandwich, Ill. ADV. PG. 190.
Ⓥ Miller, August E., 9226 Hudson Blvd., North Bergen, N. J.
Monitor Products Co., 915 Fremont Ave., So. Pasadena, Calif.
Ⓥ Nebel Lab., R. E., 1104 Lincoln Pl., Brooklyn 13, N. Y.
Ⓥ Piezo Products Co., Whitney St., Framingham, Mass.
Ⓥ Polytech Devices, Inc., 11804½ E. Grand St., Elizabeth, N. J.
Ⓥ Premier Crystal Labs., Inc., 79-89 Seventh Ave., New York 11, N. Y.
Ⓥ REEVES-HOFFMAN CORP., 321 Cherry St., Carlisle, Pa. ADV. PG. 32.
Ⓥ Scientific Radio Products Co., 738 W. Broadway, Council Bluffs, Iowa.
Ⓥ Valpey Crystals, Highland St., Holliston, Mass.
Westline Electronics Co., 11660 Olympic Blvd., Los Angeles 25, Calif.

RACKS—*Relay*

Ⓥ ALDEN PRODUCTS CO., 117 N. Main St., Brockton 64, Mass. ADV. PG. 235.
Ⓥ Altec Lansing Corp., 161 Avenue of the Americas, New York 13, N. Y.
Ⓥ ART-LLOYD METAL PRODUCTS CORP., 2925 Coppers Ave., Brooklyn 34, N. Y. ADV. PG. 272.
Ⓥ Autocall Co., The, Shelby, Ohio.
Ⓥ Automatic Electric Sales Corp., 1033 W. Van Buren St., Chicago 7, Ill.
Ⓥ Bud Radio Inc., 2118 E. 55th St., Cleveland 3, Ohio.
Ⓥ CINEMA ENGINEERING CO., 1510 W. Verdugo Ave., Burbank, Calif. ADV. PG. 186.
Ⓥ Collins Radio Co., Cedar Rapids, Iowa.
Ⓥ Cutler Metal Products Co., Camden, N. J.
Ⓥ Donnelly Electric & Mfg. Co., 3050 Washington St., Boston, Mass.
Ⓥ FALSTROM CO., 44 Falstrom Court, Passaic, N. J. ADV. PG. 162.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
Ⓥ Johnson Co., E. F., Waseca, Minn.
Ⓥ KARP METAL PRODUCTS CO., INC., 215 63rd St., Brooklyn 20, N. Y. ADV. PG. 53.
Ⓥ Kirk & Blum Mfg. Co., 2893 Spring Grove Ave., Cincinnati 25, Ohio.
Ⓥ Lenkurt Electric Co., Inc., San Carlos, Calif.
Meissner Mfg. Div., Maguire Industries, Inc., Mt. Carmel, Ill.
Ⓥ MULTI METAL WIRE CLOTH CO., INC., 1350 Garrison Ave., New York 59, N. Y. ADV. PG. 66.
Ⓥ NATIONAL CO. INC., 61 Sherman St., Malden 48, Mass. ADV. PG. 35 to 36.
Northeastern Engineering, Inc., Manchester, N. H.
Ⓥ PAR-METAL PRODUCTS CORP., 32-62 49th St., Long Island City 3, N. Y. ADV. PG. 242.
Ⓥ Press Wireless Mfg. Co., Inc., Canalapia Rd., Hicksville, L. I., N. Y.
REF Mfg. Corp., Jericho Turnpike, Mineola, N. Y.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 75. Inside Back and Back Covers.
Ⓥ Ripley Co., Inc., P. O. Box 31, Middletown, Conn.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ Walter Co., Inc., S., 1400 Atlantic Ave., Brooklyn 16, N. Y.

RADAR NAVIGATIONAL DEVICES

Ⓥ Airborne Instruments Lab., Inc., 160 Old Country Rd., Mineola, L. I., N. Y.
American Electroneering Co., 2112 S. La Brea Ave., Los Angeles, Calif.
Applied Science Corp. of Princeton, The, P. O. Box 44, Princeton, N. J.
Ⓥ Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ Collins Radio Co., Cedar Rapids, Iowa.
Ⓥ Cossor (Canada) Ltd., 301-303 Windsor St., Halifax, N. S., Canada.
Ⓥ FEDERAL TELEPHONE & RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.
Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
Gilfillan Bros., Inc., 1815 Venice Blvd., Los Angeles 6, Calif.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Racon Electric Co., 52 E. 19th St., New York 3, N. Y.
Ⓥ Radiomarine Corp. of America, 75 Varick St., New York 13, N. Y.
Ⓥ RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.
Ⓥ Submarine Signal Div., Raytheon Mfg. Co., Waltham, Mass.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 27.

RADAR SYSTEMS AND EQUIPMENT—*Aircraft Landing*

Ⓥ Air Associates, Inc., Teterboro, N. J.
Ⓥ Airborne Instruments Lab., Inc., 160 Old Country Rd., Mineola, N. Y.
American Electroneering Co., 2112 S. La Brea Ave., Los Angeles, Calif.
Ⓥ Automatic Signal Division, 100 Regent St., East Norwalk, Conn.
Ⓥ Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ Cossor (Canada) Ltd., 301-303 Windsor St., Halifax, N. S., Canada.
Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
Gilfillan Bros., Inc., 1815 Venice Blvd., Los Angeles 6, Calif.
Kennedy & Co., D. S., Cohasset, Mass.
Ⓥ Microwave Equipment Co., Inc., North Caldwell, N. J.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Racon Electric Co., 52 E. 19th St., New York 3, N. Y.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.

RADAR SYSTEMS AND EQUIPMENT—*Altimeters*

American Electroneering Co., 2112 S. La Brea Ave., Los Angeles, Calif.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 75. Inside Back and Back Covers.
Ⓥ RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
VECTRON, INC., 235 High St., Waltham, Mass. ADV. PG. 266.

RADAR SYSTEMS AND EQUIPMENT—*Receivers*

Ⓥ Airborne Instruments Lab., Inc., 160 Old Country Rd., Mineola, N. Y.
Ⓥ Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ Cossor (Canada) Ltd., 301-303 Windsor St., Halifax, N. S., Canada.
Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
Gilfillan Bros., Inc., 1815 Venice Blvd., Los Angeles 6, Calif.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Polarad Electronics Corp., 100 Metropolitan Ave., Brooklyn 11, N. Y.
Ⓥ Racon Electric Co., 52 E. 19th St., New York 3, N. Y.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 75. Inside Back and Back Covers.
Ⓥ RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.

V indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

V Submarine Signal Div., Raytheon Mfg. Co., Waltham, Mass.
Telesonic, Inc., 100 Greylock Pl., Stamford, Conn.
V Transmitter Equipment Co., Inc., 345 Hudson St., New York 14, N. Y.

RADAR SYSTEMS AND EQUIPMENT—*Trainers*

V Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
V Canadair Ltd., 901-903 Windsor St., Halifax, N. S., Canada
V Electronic Associates, Inc., Long Branch, N. J.
Gilfillan Bros., Inc., 1815 Venice Blvd., Los Angeles 6, Calif.
V Kollsman Instrument Div., Square D Co., Elmhurst, L. I., N. Y.
V Link Radio Corp., 125 W. 17th St., New York, N. Y.
V Precision Equipment Co., Inc., 9101 King, Franklin Park, Ill.
V Radio Corp. of America, RCA Victor Div., Camden, N. J.
V Raytheon Mfg. Co., Equipment Sales Div., Waltham 54, Mass.
V Reeves Instrument Corp., 215 E. 91st St., New York, N. Y.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
V Transmitter Equipment Co., Inc., 345 Hudson St., New York 14, N. Y.
VECTRON, INC., 238 High St., Waltham, Mass.

RADAR SYSTEMS AND EQUIPMENT—*Transmitters*

V Airborne Instruments Lab., Inc., 160 Old Country Rd., Mineola, N. Y.
V Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
V Canadair Ltd., 901-903 Windsor St., Halifax, N. S., Canada
V GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 16.
Gilfillan Bros., Inc., 1815 Venice Blvd., Los Angeles 6, Calif.
V Kollsman Instrument Co., Inc., North Caldwell, N. J.
V Precision Corp., Tioga & C. Sts., Philadelphia 34, Pa.
V RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
V RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
V Reeves Instrument Corp., 215 E. 91st St., New York, N. Y.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
V SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.
V Submarine Signal Div., Raytheon Mfg. Co., Waltham, Mass.
V Transmitter Equipment Co., Inc., 345 Hudson St., New York 14, N. Y.
V WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

RADIO ISOTOPES

See Isotopes, Radioactive

RADIOSONDES—*Electrical Measurement Type*

Applied Science Corp. of Princeton, The, P. O. Box 44, Princeton, N. J.
V BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
V Bendix Aviation Corp., Pacific Division, 11600 Sherman Way, N. Hollywood, Calif.
Mitchell Institution Co., Aircraft Control Div., 335 E. Price St., Philadelphia, Pa.
Northeastern Engineering, Inc., Manchester, N. H.
V Signal Corps, Tioga & C. Sts., Philadelphia 34, Pa.
Tele-tronics Industries, Inc., 401 E. 138th St., New York 54, N. Y.

RADIUM

V Canadian Radium & Uranium Corp., 630 Fifth Ave., New York 20, N. Y.
St. Joseph X-Ray Laboratory, Canton, N. Y.
V U. S. Radium Corp., 525 Pearl St., New York 7, N. Y.

RATIOMETERS

V EDISON, INC., THOMAS A., INSTRUMENT DIV., W. Orange, N. J. ADV. PG. 119.
V Ewen Engineering Co., 92 Ridge Ave., Naugatuck, Conn.
V Gerathon Research Instrument Corp., 8 Fort Ave., Mt. Vernon, N. Y.
V WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 109.

REACTORS

See Chokes and Coils, Choke

REACTORS—*Saturable*

Acro Products Co., 5330 Baltimore Ave., Philadelphia, Pa.
V Acro Transformer Mfg. Corp., 21-20 33rd Ave., Long Island City, N. Y.
V Altec Lansing Corp., 161 Avenue of the Americas, New York 13, N. Y.
V COMMUNICATION ACCESSORIES CO., Box 345, 11019 St. & Hillcrest Rd., Hillcrest Hills, Md. ADV. PG. 178.
V Dresser Electric Co., 943 E. Larned St., Detroit 7, Mich.
Electron Mfg. Co., 4516 Vidor Ave., Chicago, Ill.
V Electro Engineering Works, 6021 College Ave., Oakland 18, Calif.
V FERRANTI ELECTRIC, INC., 30 Rockefeller Plaza, New York 20, N. Y. ADV. PG. 81.
V FREED TRANSFORMER CO., INC., 1716 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 143.
V GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 9 to 16.
V HIGHLAND ENGINEERING CO., 32 Human Blvd., Hicksville, N. Y. ADV. PG. 144.
V K-V Transformer Corp., 4414 Park Ave., New York 57, N. Y.
V Kear, Inc., 110 Iona Ave., N.W., Grand Rapids 2, Mich.
V Magnetic Instrument Co., 82 W. Main St., West Orange, N. J.
V Osburne Transformer Corp., 948 E. Lafayette Ave., Detroit 7, Mich.
V R. N. C. Mfg. Co., Inc., Box 277, Orleans, Wis.
V SORENSON & CO., INC., 375 Fairfield Ave., Stamford, Conn. ADV. PG. 143.
V Thor Electric & Machine Works, 25 S. Jefferson St., Chicago, Ill.

RECEIVERS—*Aircraft*

V Aeronautical Communications Equipment, Inc., 3090 Douglas Rd., Miami 45, Fla.
V Air Associates Inc., Teterboro, N. J.
V AIRCRAFT RADIO CORP., Boonton, N. J. ADV. PG. 198, 199.
American Electroneering Co., 2112 S. La Brea Ave., Los Angeles, Calif.
V Belmont Radio Corp. Div. Raytheon Mfg. Co., 5921 W. Dickens Ave., Chicago 39, Ill.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
V Collins Radio Co., Cedar Rapids, Iowa
V Communications Co., Inc., 300 Greco Ave., Coral Gables 34, Fla.
V Canadair (Canada) Ltd., 901-903 Windsor St., Halifax, N. S., Canada
V Hickok Radio & Television Co., Lakes, Minn.
Electronic Specialty Co., 1416 Glendale Blvd., Los Angeles 39, Calif.
Elton, Inc., 307 N. Jackson St., Jackson, Mich.
Erie Radio Labs, Inc., E. Stewart Ave., Garden City, N. Y.
Espey Mfg. Co., Inc., 528 E. 72nd St., New York, N. Y.
V FEDERAL TELEPHONE AND RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.
V GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 16.
V Hallicrafters Co., 4401 W. Fifth Ave., Chicago 24, Ill.
James Electronics Corp., 4306 N. Folletton Ave., Chicago 34, Ill.
V Kear, Inc., 110 Iona Ave., N. W., Grand Rapids 2, Mich.
V Mitchell Industries, Inc., Camp Wolters, Mineral Wells, Texas
V RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
V RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
Smuckler & Co., Inc., A. F., 202 Tillary St., Brooklyn 1, N. Y.
V Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England
Telemark, Inc., 100 Greylock Pl., Stamford, Conn.

RECEIVERS—*a-m Fixed Frequency*

V American Communications Corp., 306 Broadway, New York 7, N. Y.
American Electroneering Co., 2112 S. La Brea Ave., Los Angeles, Calif.
V BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
V Bassett Inc., Rex, 307-11 N.W. 1st Ave., Fort Lauderdale, Fla.
V Belmont Radio Co., Div. Raytheon Mfg. Co., 5921 W. Dickens Ave., Chicago 39, Ill.
V Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.
V Radio Electronics Corp., 55 Vanden St., New York 13, N. Y.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
V Cadre Instrument Corp., 1101 King St., Silver Spring, Md.
V Carlton Audio Products Co., P. O. Box 168, Westfield, N. J.
V Collins Radio Co., Cedar Rapids, Iowa
V Communications Co., Inc., 300 Greco Ave., Coral Gables 34, Fla.
V Cornet Radio & Television Corp., 500 W. 52nd St., New York 19, N. Y.
V Doolittle Radio, Inc., 7421 S. Loomis Blvd., Chicago 36, Ill.
V ELECTRONIC MEASUREMENTS CO., Red Bank, N. J. ADV. PG. 237.
V EL-TRONICS, INC., 2649 N. Howard St., Philadelphia 33, Pa. ADV. PG. 238.
Erie Radio Labs., Inc., E. Stewart Ave., Garden City, N. Y.
Fisher Research Lab., 1961 University Ave., Palo Alto, Calif.
V Gates Radio Co., Quincy, Ill.
V Hallicrafters Co., 4401 W. Fifth Ave., Chicago 24, Ill.
V Hammarlund Mfg. Co., 460 W. 34th St., New York 6, N. Y.
Hartley Co., Ltd., H. A., 152 Hammersmith Rd., London W. 6, England
V Hastings Instrument Co., Box 1275, Hampton, Va.
V Kaar Engineering Co., 2995 Middlefield Rd., Palo Alto, Calif.
Kinsey Radio Mfg. Co., 5807 Oak St., Omaha 7, Nebraska
V Kear, Inc., 110 Iona Ave., N.W., Grand Rapids 2, Mich.
V Link Radio Corp., 125 W. 17th St., New York, N. Y.
V NATIONAL CO., INC., 61 Sherman St., Malden 48, Mass. ADV. PG. 33 to 36.
Northeastern Engineering, Inc., Manchester, N. H.
V Northern Radio Co., 314 Bell St., Seattle 1, Wash.
V Press Wireless Mfg. Co., Inc., Cantiague Rd., Hicksville, N. Y.
V RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
Smuckler & Co., Inc., A. F., 202 Tillary St., Brooklyn 1, N. Y.
V Transmitter Equipment Co., Inc., 345 Hudson St., New York 14, N. Y.
V Wilcox Electric Co., 1400 Chestnut St., Kansas City, Mo.

RECEIVERS—*a-m f-m Communication*

V Altec Lansing Corp., 161 Avenue of the Americas, New York 13, N. Y.
V American Communications Corp., 306 Broadway, New York 7, N. Y.
American Electroneering Co., 2112 S. La Brea Ave., Los Angeles, Calif.
V BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
V Bassett Inc., Rex, 307-11 N.W. 1st Ave., Fort Lauderdale, Fla.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
V Collins Radio Co., Cedar Rapids, Iowa
V Communications Co., Inc., 300 Greco Ave., Coral Gables 34, Fla.
V ELECTRONIC MEASUREMENTS CO., Red Bank, N. J. ADV. PG. 237.
V EL-TRONICS, INC., 2649 N. Howard St., Philadelphia 33, Pa. ADV. PG. 238.
Espey Mfg. Co., Inc., 528 E. 72nd St., New York, N. Y.
V Fisher Radio Corp., 41 E. 47th St., New York, N. Y.
V GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 16.
V Hallicrafters Co., 4401 W. Fifth Ave., Chicago 24, Ill.
V Hastings Instrument Co., Box 1275, Hampton, Va.
V Kinsey Radio Mfg. Co., 5807 Oak St., Omaha 7, Nebr.
Kear, Inc., 110 Iona Ave., N.W., Grand Rapids 2, Mich.
V NATIONAL CO., INC., 61 Sherman St., Malden 48, Mass. ADV. PG. 33 to 36.
Radio Mfg. Engineers, Inc., 300-302 First Ave., Peoria 5, Ill.
V Radiomarine Corp. of America, 75 Varick St., New York 13, N. Y.
V RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
V Schuttig & Co., Inc., 9th & Kearney Sts., N.E., Washington 17, D. C.
Smuckler & Co., Inc., A. F., 202 Tillary St., Brooklyn 1, N. Y.
V Technical Materiel Corp., The, 453 W. 47th St., New York 19, N. Y.
V Transmitter Equipment Co., Inc., 345 Hudson St., New York 14, N. Y.
V WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
V Wilcox Electric Co., 1400 Chestnut St., Kansas City, Mo.

RECEIVERS—*Automatic Radio Alarm*

V Radiomarine Corp. of America, 75 Varick St., New York 13, N. Y.
V Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England

RECEIVERS—*Automobile*

V Bassett Inc., Rex, 307-11 N.W. 1st Ave., Fort Lauderdale, Fla.
V Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.
V Communications Co., Inc., 300 Greco Ave., Coral Gables 34, Fla.
V Delco Radio Div., General Motors Corp., Kokomo, Ind.

Ⓥ Eckstein Radio & Television Co., LeRoy, Minn.
Ⓥ **ELECTRONIC MEASUREMENTS CO.**, Red Bank, N. J. ADV., PG. 139.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ **SYLVANIA ELECTRIC PRODUCTS, INC.**, Radio & Television Div., 254 Rano St., Buffalo 7, N. Y. ADV. PG. 286 to 290.
Ⓥ Wells-Gardner & Co., 2701 N. Kildare Ave., Chicago 39, Ill.

RECEIVERS—*Coin Operated*

Ⓥ American Communications Corp., 306 Broadway, New York 7, N. Y.
Ⓥ Collins Radio Co., Cedar Rapids, Iowa.
Ⓥ Coronet Radio & Television Corp., 500 W. 52nd St., New York 19, N. Y.
Jamaica Television Mfg. Co., 95-26 Sutphin Blvd., Jamaica 4, N. Y.
Ⓥ **LAVOIE LABORATORIES**, Morganville, N. J. ADV. PG. 151.
Ⓥ Magna Electronics Co., 3797-11 W. Jefferson, Los Angeles 16, Calif.
Ⓥ Mattison Television & Radio Corp., 893 Broadway, New York 3, N. Y.
Ⓥ National Polytronics, Inc., 2440 Atlantic Ave., Brooklyn, N. Y.
Northeastern Engineering, Inc., Manchester, N. H.

RECEIVERS—*Communication and Amateur*

Ⓥ Bassett, Inc., Rex, 307-11 N. W. 1st Ave., Fort Lauderdale, Fla.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ Communications Co., Inc., 300 Greco Ave., Coral Gables 34, Fla.
Eckstein Radio & Television Co., LeRoy, Minn.
Ⓥ **EL-TRONICS, INC.**, 2649 N. Howard St., Philadelphia 33, Pa. ADV. PG. 238.
Espey Mfg. Co., Inc., 528 E. 72nd St., New York N. Y.
Fisher Research Lab., 1961 University Ave., Palo Alto, Calif.
Ⓥ **GENERAL ELECTRIC CO.**, Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
Ⓥ Hallicrafters Co., 4401 W. Fifth Ave., Chicago 24, Ill.
Ⓥ Hammarlund Mfg. Co., 460 W. 34th St., New York 1, N. Y.
Ⓥ Kellogg Switchboard & Supply Co., 6650 S. Cicero Ave., Chicago 38, Ill.
Kinney Radio Mfg. Co., 5807 Oak St., Omaha 7, Nebr.
Lear, Inc., 110 Ionia Ave., N.W., Grand Rapids 2, Mich.
McMurdo Silver Co., 1240 Main St., Hartford 3, Conn.
Ⓥ Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.
Ⓥ **NATIONAL CO., INC.**, 61 Sherman St., Malden 48, Mass. ADV. PG. 33 to 36.
Ⓥ Press Wireless Mfg. Co., Inc., Cantiague Rd., Hicksville, L. I., N. Y.
Radio Mfg. Engineers, Inc., 300-302 First Ave., Peoria 6, Ill.
Ⓥ **RAYTHEON MFG. CO.**, Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
Ⓥ Technical Materiel Corp., The, 453 W. 47th St., New York 19, N. Y.
West Coast Electronics Co., 1601 S. Burlington St., Los Angeles 6, Calif.
Ⓥ Wilcox Electric Co., 1400 Chestnut St., Kansas City, Mo.

RECEIVERS—*Crystal Sets*

Atlas Electric Products Co., P. O. Box 1591, Erie, Pa.
Ⓥ Laurenk Radio Mfg. Co., 3931 Monroe Ave., Wayne, Mich.
Ⓥ Miller Co., J. W., 5917 S. Main St., Los Angeles, Calif.
Ⓥ Philmore Mfg. Co., 113 University Place, New York 3, N. Y.
Plastics & Electronics Co., 272 Northland Ave., Buffalo 8, N. Y.
Tasteen Equipment Co., Inc., 120 Greenwich St., New York 6, N. Y.
Telequip Radio Co., 1901 S. Washtenaw, Chicago, Ill.

RECEIVERS—*Diversity Reception*

Ⓥ **BARKER & WILLIAMSON**, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ Collins Radio Co., Cedar Rapids, Iowa.
Erco Radio Labs., Inc., E. Stewart Ave., Garden City, N. Y.
Ⓥ Hammarlund Mfg. Co., 460 W. 34th St., New York 1, N. Y.
Ⓥ **NATIONAL CO., INC.**, 61 Sherman St., Malden 48, Mass. ADV. PG. 33 to 36.
Ⓥ **NORTHERN RADIO CO., INC.**, 143-145 W. 22nd St., New York 11, N. Y. ADV. PG. 137, 138.
Ⓥ Press Wireless Mfg. Co., Inc., Cantiague Rd., Hicksville, L. I., N. Y.
Ⓥ Schuttig & Co., Inc., 9th & Kearney Sts., N. E., Washington 17, D. C.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ Technical Materiel Corp., The, 453 W. 47th St., New York 19, N. Y.

RECEIVERS—*Fixed Frequency*

Ⓥ Air Associates Inc., Teterboro, N. J.
Ⓥ American Communications Corp., 306 Broadway, New York 7, N. Y.
Ⓥ **BARKER & WILLIAMSON**, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ Bassett, Inc., Rex, 307-11 N. W. 1st Ave., Fort Lauderdale, Fla.
Ⓥ Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.
Ⓥ Brelco Electronics Corp., 55 Vandam St., New York 13, N. Y.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ Carnine & Bitter, 2332 Ontario Rd., N.W., Washington 9, D. C.
Ⓥ Clarke Instrument Corp., 910 King St., Silver Spring, Md.
Ⓥ Collins Audio Products Co., P. O. Box 368, Westfield, N. J.
Ⓥ Collins Radio Co., Cedar Rapids, Iowa.
Communications Co., Inc., 300 Greco Ave., Coral Gables 34, Fla.
Ⓥ Doolittle Radio, Inc., 7421 S. Loomis Blvd., Chicago 36, Ill.
Ⓥ **EL-TRONICS, INC.**, 2649 N. Howard St., Philadelphia 33, Pa. ADV. PG. 238.
Erco Radio Labs., Inc., E. Stewart Ave., Garden City, N. Y.
Fisher Research Lab., 1961 University Ave., Palo Alto, Calif.
Ⓥ Hallicrafters Co., 4401 W. Fifth Ave., Chicago 24, Ill.
Ⓥ Hastings Instrument Co., Box 1275, Hampton, Va.
Ⓥ Kaar Engineering Co., 2995 Middlefield Rd., Palo Alto, Calif.
Ⓥ Kaltefell Labs., Inc., 1076 Morena Blvd., San Diego 10, Calif.
Kinney Radio Mfg. Co., 5807 Oak St., Omaha 7, Nebraska.
Ⓥ **LAVOIE LABORATORIES**, Morganville, N. J. ADV. PG. 151.
Ⓥ Maryland Electronic Mfg. Corp., 5009 Calvert Rd., College Park, Md.
Meissner Mfg. Div., Maguire Industries, Inc., Mt. Carmel, Ill.
Monroe Colt Co., 2839 N. Narragansett Ave., Chicago 34, Ill.
Ⓥ **NATIONAL CO., INC.**, 61 Sherman St., Malden 48, Mass. ADV. PG. 33 to 36.
Northeastern Engineering, Inc., Manchester, N. H.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Press Wireless Mfg. Co., Inc., Cantiague Rd., Hicksville, L. I., N. Y.
Radio Specialty Mfg. Co., 2023 S. E. 6th Ave., Portland 14, Ore.
Smuckler & Co., Inc., A. F., 202 Tillary St., Brooklyn 1, N. Y.
Ⓥ **SPERRY GYROSCOPE CO.**, Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.
Ⓥ Technical Materiel Corp., The, 453 W. 47th St., New York 19, N. Y.
Ⓥ Transmitter Equipment Co., Inc., 345 Hudson St., New York 14, N. Y.
Ⓥ Wilcox Electric Co., 1400 Chestnut St., Kansas City, Mo.

RECEIVERS—*f-m*

Ⓥ Altec Lansing Corp., 161 Avenue of the Americas, New York 13, N. Y.
Ⓥ **BARKER & WILLIAMSON**, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ Bassett, Inc., Rex, 307-11 N. W. 1st Ave., Fort Lauderdale, Fla.
Ⓥ Capehart-Farnsworth Corp., Fort Wayne, Indiana.
Ⓥ Clarke Instrument Corp., 910 King St., Silver Spring, Md.
Ⓥ Collins Audio Products Co., P. O. Box 368, Westfield, N. J.
Ⓥ Communications Co., Inc., 300 Greco Ave., Coral Gables 34, Fla.
Espey Mfg. Co., Inc., 528 E. 72nd St., New York 19, N. Y.
Ⓥ Fada Radio & Electric Co., Inc., 525 Main St., Belleville, N. J.
Ⓥ Fisher Radio Corp., 41 E. 47th St., New York, N. Y.
Ⓥ **GENERAL ELECTRIC CO.**, Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
Ⓥ Hallicrafters Co., 4401 W. Fifth Ave., Chicago 24, Ill.
Ⓥ **HARVEY RADIO LABS., INC.**, 447 Concord Ave., Cambridge, Mass. ADV. PG. 104.
Ⓥ Kaar Engineering Co., 2995 Middlefield Rd., Palo Alto, Calif.
Ⓥ Kaltefell Labs., Inc., 1076 Morena Blvd., San Diego 10, Calif.
Kinney Radio Mfg. Co., 5807 Oak St., Omaha 7, Nebraska.
Ⓥ Maryland Electronic Mfg. Corp., 5009 Calvert Rd., College Park, Md.
Ⓥ Mattison Television & Radio Corp., 893 Broadway, New York 3, N. Y.
Meissner Mfg. Div., Maguire Industries Inc., Mt. Carmel, Ill.
Ⓥ **NATIONAL CO., INC.**, 61 Sherman St., Malden 48, Mass. ADV. PG. 33 to 36.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Radio Engineering Labs., Inc., 36-40 37th St., Long Island City, N. Y.
Ⓥ **RAYTHEON MFG. CO.**, Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
Ⓥ Schuttig & Co., Inc., 9th & Kearney Sts., N. E., Washington 17, D. C.
Smuckler & Co., Inc., A. F., 202 Tillary St., Brooklyn 1, N. Y.
Ⓥ **SPERRY GYROSCOPE CO.**, Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.
Ⓥ Standard Telephones & Cables Co., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ **SYLVANIA ELECTRIC PRODUCTS, INC.**, Radio & Television Div., 254 Rano St., Buffalo 7, N. Y. ADV. PG. 286 to 290.
Ⓥ **WESTINGHOUSE ELECTRIC CORP.**, P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

RECEIVERS—*Loran*

Ⓥ Cossor (Canada) Ltd., 301-303 Windsor St., Halifax, N. S., Canada.
Ⓥ **HARVEY RADIO LABS., INC.**, 447 Concord Ave., Cambridge, Mass. ADV. PG. 104.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Radiomarine Corp. of America, 75 Varick St., New York 13, N. Y.
Ⓥ **RAYTHEON MFG. CO.**, Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
Ⓥ **SPERRY GYROSCOPE CO.**, Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.

RECEIVERS—*Marine*

Ⓥ Applied Electronics Co., 1246 Folsom St., San Francisco 3, Calif.
Ⓥ Bassett, Inc., Rex, 307-11 N. W. 1st Ave., Fort Lauderdale, Fla.
Ⓥ Communications Co., Inc., 300 Greco Ave., Coral Gables 34, Fla.
Erco Radio Labs., Inc., E. Stewart Ave., Garden City, N. Y.
Fisher Research Lab., 1961 University Ave., Palo Alto, Calif.
Ⓥ **GENERAL ELECTRIC CO.**, Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
Ⓥ Harvey Wells Electronics Inc., North St., Southbridge, Mass.
Ⓥ Intervox Corp., 2701 California Ave., Seattle 6, Wash.
Ⓥ Jefferson, Inc., Ray, 40 E. Merrick Rd., Freeport L. I., N. Y.
Ⓥ Kaar Engineering Co., 2995 Middlefield Rd., Palo Alto, Calif.
Ⓥ Northern Radio Co., 314 Bell St., Seattle 1, Wash.
Ⓥ Radiomarine Corp. of America, 75 Varick St., New York 13, N. Y.
Ⓥ **RAYTHEON MFG. CO.**, Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
Ⓥ **REEVES-HOFFMAN CORP.**, 321 Cherry St., Carlisle, Pa. ADV. PG. 32.
Ⓥ **SPERRY GYROSCOPE CO.**, Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ Submarine Signal Div., Raytheon Mfg. Co., Waltham, Mass.
Ⓥ **WESTINGHOUSE ELECTRIC CORP.**, P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

RECEIVERS—*Microwave*

Ⓥ Airborne Instruments Lab., Inc., 160 Old Country Rd., Mineola, L. I., N. Y.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ Canoga Corp., 14315 Bessemer St., P. O. Box 361, Van Nuys, Calif.
Ⓥ Cossor (Canada) Ltd., 301-303 Windsor St., Halifax, N. S., Canada.
Ⓥ **ELECTRONIC MEASUREMENTS CO.**, Red Bank, N. J. ADV. PG. 139.
Ⓥ **GENERAL ELECTRIC CO.**, Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
Ⓥ Microwave Equipment Co., Inc., North Caldwell, N. J.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Polarad Electronics Corp., 100 Metropolitan Ave., Brooklyn 11, N. Y.
Ⓥ **POLYTECHNIC RESEARCH & DEVELOPMENT CO., INC.**, 202 Tillary St., Brooklyn 1, N. Y. ADV. PG. 56, 57.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ **SPERRY GYROSCOPE CO.**, Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.
Ⓥ Submarine Signal Div., Raytheon Mfg. Co., Waltham, Mass.
Ⓥ Weymouth Instrument Co., 1440 Commercial St., East Weymouth 89, Mass.

RECEIVERS—*Panoramic*

Ⓥ **PANORAMIC RADIO PRODUCTS, INC.**, 10 South Second Ave., Mt. Vernon, N. Y. ADV. PG. 270.
Ⓥ Polarad Electronics Corp., 100 Metropolitan Ave., Brooklyn 11, N. Y.
Ⓥ **VECTRON, INC.**, 235 High St., Waltham, Mass. ADV. PG. 266.

V indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

RECEIVERS—*Portable & Mobile*

V BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
V Bassett, Inc., Rex., 307-11 N.W. 1st Ave., Fort Lauderdale, Fla.
V Belmont Radio Co., Div. Raytheon Mfg. Co., 5921 W. Dickens Ave., Chicago 39, Ill.
V Collins Audio Products Co., P. O. Box 368, Westfield, N. J.
V Communications Co., Inc., 300 Greco Ave., Coral Gables 34, Fla.
V Concertone Radio Inc., 7421 S. Lovers Blvd., Chicago 49, Ill.
V EL TRONICS, INC., 2647 N. Howard St., Philadelphia 33, Pa. ADV. PG. 236.
Espey Mfg. Co., Inc., 528 E. 72nd St., New York, N. Y.
V GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
V Hallicrafters Co., 4401 W. 5th Ave., Chicago 24, Ill.
V HARVEY RADIO LABS., INC., 447 Concord Ave., Cambridge, Mass. ADV. PG. 104.
V Kaar Engineering Co., 2995 Middlefield Rd., Palo Alto, Calif.
V Ker, Inc., 110 Ionia Ave., N.W., Grand Rapids 2, Mich.
V Link Radio Corp., 125 W. 17th St., New York, N. Y.
V Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Plastics & Electronics Co., 272 Nottland Ave., Buffalo 8, N. Y.
V RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 13 to 15, Inside Back and Back Covers.
V RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
V Rowe Engineering Products, Inc., Raymond 32nd & Walnut Sts., Philadelphia 4, Pa.
Smucker & Co., Inc., A. F., 202 Tillary St., Brooklyn 1, N. Y.

RECEIVERS—*Radio Direction Finder*

V Allborne Instruments Lab., Inc., 160 Old Country Rd., Mineola, L. I., N. Y.
V Applied Electronics Co., 1256 Folsom St., San Francisco 3, Calif.
V BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
V Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.
V Fairchild Camera & Instrument Corp., 88-06 Van Wyck Blvd., Jamaica, N. Y.
V FEDERAL TELEPHONE AND RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.
Fisher Research Lab., 1961 University Ave., Palo Alto, Calif.
V Gertz Instrument Co., 489 Belmont St., Belmont 78, Mass.
V Hallmark Labs., 2701 California Ave., Seattle 6, Wash.
V Jones Electronics Corp., 6058 W. Fullerton Ave., Chicago 39, Ill.
V Jefferson Inc., Box 45 E. Manlius 84, Fremont, L. I., N. Y.
V Kaar Engineering Co., 2995 Middlefield Rd., Palo Alto, Calif.
V Ker, Inc., 110 Ionia Ave., N.W., Grand Rapids 2, Mich.
V Link Radio Corp., 125 W. 17th St., New York, N. Y.
V Mitchell Industries, Inc., Camp Wolters, Mineral Wells, Texas.
V Pioneer Gen-E-Motor Corp., 466 W. Superior St., Chicago 10, Ill.
V Radiomarine Corp. of America, 75 Varick St., New York 13, N. Y.
V RAYTHEON MFG. CO., Power Tube Div., Waltham 54, Mass. ADV. PG. 257.
Smucker & Co., Inc., A. F., 202 Tillary St., Brooklyn 1, N. Y.
V Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
V Telemarine Signal Div., Raytheon Mfg. Co., Waltham, Mass.

RECEIVERS—*Railroad*

V Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.
V Communications Co., Inc., 300 Greco Ave., Coral Gables 34, Fla.
V RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
V WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 11.

RECEIVERS—*uhf*

V Air Associates, Inc., Teterboro, N. J.
Bonner & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
V Canoga & Butler, 2443 Ontario St., N.W., Washington 9, D. C.
V Clarke Instrument Corp., 910 King St., Silver Spring, Md.
V Communications Co., Inc., 300 Greco Ave., Coral Gables 34, Fla.
V EL TRONICS, INC., 2647 N. Howard St., Philadelphia 33, Pa. ADV. PG. 236.
V Hallicrafters Co., 4401 W. 5th Ave., Chicago 24, Ill.
Jamaica Television Mfg. Co., 95-26 Sutphin Blvd., Jamaica 4, N. Y.
V Kaar Engineering Co., 2995 Middlefield Rd., Palo Alto, Calif.
V Link Radio Corp., 125 W. 17th St., New York, N. Y.
V Maryland Electronic Mfg. Corp., 5009 Calvert Rd., College Park, Md.
McMurdo Silver Co., 1240 Main St., Hartford 43, Mass.
V NATIONAL CO., INC., 61 Sherman St., Malden 48, Mass. ADV. PG. 33 to 36.
V Polarad Electronics Corp., 100 Metropolitan Ave., Brooklyn 11, N. Y.
V RAYTHEON MFG. CO., Power Tube Div., Waltham 54, Mass. ADV. PG. 257.
Smucker & Co., Inc., A. F., 202 Tillary St., Brooklyn 1, N. Y.
V SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.
Telemark, Inc., 100 Greyrock Pl., Stamford, Conn.
V Transmitter Equipment Co., Inc., 545 Hudson St., New York 14, N. Y.
V Wilcox Electric Co., 1400 Chestnut St., Kansas City, Mo.

RECEIVERS—*vhf*

V Air Associates, Inc., Teterboro, N. J.
V Belmont Radio Co., Div. Raytheon Mfg. Co., 5921 W. Dickens Ave., Chicago 39, Ill.
V Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.
Bonner & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
V Clarke Instrument Corp., 910 King St., Silver Spring, Md.
V Collins Radio Co., Cedar Rapids, Iowa.
V Communications Co., Inc., 300 Greco Ave., Coral Gables 34, Fla.
V FEDERAL TELEPHONE & RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.
V Hallicrafters Co., 4401 W. 5th Ave., Chicago 24, Ill.
Jamaica Television Mfg. Co., 95-26 Sutphin Blvd., Jamaica 4, N. Y.
V Kaar Engineering Co., 2995 Middlefield Rd., Palo Alto, Calif.
V Kear, Inc., 110 Ionia Ave., N.W., Grand Rapids 2, Mich.
V Link Radio Corp., 125 W. 17th St., New York, N. Y.
McMurdo Silver Co., Inc., 1240 Main St., Hartford 3, Conn.
V Maryland Electronic Mfg. Corp., 5009 Calvert Rd., College Park, Md.
V Mitchell Industries, Inc., Camp Wolters, Mineral Wells, Texas.
V NATIONAL CO., INC., 61 Sherman St., Malden 48, Mass. ADV. PG. 33 to 36.
V National Electronics Labs., Inc., 2713 Kalorama Rd., N.W., Washington 9, D. C.
V Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
V Polarad Electronics Corp., 100 Metropolitan Ave., Brooklyn 11, N. Y.
V Radio Mfg. Engineers, Inc., 1161-1167 First Ave., Peoria 2, Ill.
V RADIO RECEPTOR CO., 251 W. 19th St., New York, N. Y. ADV. PG. 188.
V RAYTHEON MFG. CO., Power Tube Div., Waltham 54, Mass. ADV. PG. 257.
V Schutte & Koerting Co., Inc., Wm. & Keeney, Inc., N. E., Cornwells Heights, Pa.
Smucker & Co., Inc., A. F., 202 Tillary St., Brooklyn 1, N. Y.
V Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Telemark, Inc., 100 Greyrock Pl., Stamford, Conn.
V Transmitter Equipment Co., Inc., 545 Hudson St., New York 14, N. Y.
V Wilcox Electric Co., 1400 Chestnut St., Kansas City, Mo.

RECEIVERS, HOME

1. a-m phono, Console
2. a-m phono, Table
3. a-m Console
4. a-m Portable
5. a-m Table
6. a-m Vest Pocket
7. a-m f-m phono, Console
8. a-m f-m phono, Table
9. a-m f-m Console
10. a-m f-m Portable
11. a-m f-m Table
12. f-m Console
13. f-m Portable
14. f-m Table
15. t-v Console
16. t-v Portable
17. t-v Table
18. f-m t-v Console
19. f-m t-v Table
20. a-m f-m t-v Console
21. am- f-m t-v Table
22. a-m f-m t-v phono, Console
23. Recorder and Phonograph combination
24. Built-in wall type

V Admiral Corp., 3800 Cortland St., Chicago 47, Ill. 1-2-4-5-7-15-17-20-22.
Air-King Products Co., Inc., 170-53rd St., Brooklyn, N. Y. 1-2-3-4-5-6-7-8-11-15-17-18-19-20-21-22-23.
V Altec Lansing Corp., 161 Avenue of the Americas, New York 13, N. Y. 15-17-24.
V American Communications Corp., 306 Broadway, New York 7, N. Y. 5-24.
V Andrea Radio Corp., 27-01 Bridge Plaza North, Long Island City 1, N. Y. 4-18-19-20-21-22.
V Ansley Radio & Television Inc., 41 St. Joes Ave., Trenton 9, N. J. 7-16-17-20-22.
V Audio Industries, Michigan City, Ind. 23.
V Autocrat Radio Co., 1955 N. Hamilton Ave., Chicago 47, Ill. 5.
Automatic Radio Mfg. Co., Inc., 122 Brookline Ave., Boston, Mass. 2-3-4-5-6-8-9-14-23.
V Belmont Radio Co., Div. Raytheon Mfg. Co., 5921 W. Dickens Ave., Chicago 39, Ill. 4-5-6-7-11-15-16-17-22.
V Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md. 1-5-7-11-15-17-20-22.
Bowers Battery & Spark Plug Co., Reading, Pa. 14-17.
Cabinet Engineering & Electronics Co., 8218 N. Highland Ave., Hollywood 38, Calif. 2-5-17-18-19-22.
V Capehart-Farnsworth Corp., Fort Worth, Indiana. 7-15-17-20-22.
V Cascade Television Co., 179 South St., Newark, N. J. 15-17.
V Collins Audio Products Co., P. O. Box 368, Westfield, N. J. 24.
Commercial Equipment Co., Inc., Box 168, Lawrence, Kansas.
Cornet Radio & Television Corp., 500 W. 52nd St., New York 19, N. Y. 2-4-9.
V Cossor (Canada) Ltd., 301-309 Windsor St., Halifax, N. S., Canada. 1-3-5-15-17.
V Crosley Div., Avco Mfg. Corp., Cincinnati 25, Ohio. 1-2-3-4-5-11-15-16-17-22-24.
V DeWald Radio Mfg. Corp., 35-15 37th Ave., Long Island City, N. Y. 1-4-5-7-11-15-17.
V DuMont Laboratories, Inc., Allen B., Television Receiver Div., Market St., East Paterson, N. J. 15-17-18-19-20-22-24.
V Eckstein Radio & Television Co., LeRoy, Minn. 5.
V Emerson Radio & Phonograph Corp., 111 8th Ave., New York, N. Y. 1-2-3-4-5-6-7-8-9-10-11-12-13-14-15-16-17-20-21-22.
Espey Mfg. Co., Inc., 528 E. 72nd St., New York, N. Y. 1-2-3-4-5-7-8-10-24.
V Fada Radio & Electric Co., Inc., 42-46 Main St., Belleville, N. J. 3-4-7-8-9-11-14-15-17-18-20-22.
V Fairchild Recording Equipment Corp., 154th St. & 7th Avenue, Whitestone, N. Y. 23.
V Federal Television Corp., 131-9-41 Dudie St., New York 13, N. Y. 15-17-18-19-22.
V Fuller Engineering Co., 1601 S. Federal St., Chicago 16, Ill. 16.
V Fisher Radio Corp., 41 E. 47th St., New York, N. Y. 7-15-17-18-20-22.
V Flush Wall Radio Co., 9 W. Park St., Newark 2, N. J. 24.
Freed Radio Corp., 200 Hudson St., New York, N. Y. 7-11-12-15-20-22.
V GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. 1-2-3-4-5-7-8-9-10-11-12-14-15-17-20-21-22-23. ADV. PG. 5 to 18.
Hartley Co., Ltd., 1 & 2 A, 297 Hammersmith Rd., London W 6, England. 3-5.
V HEATH CO., Benton Harbor, Mich. ADV. PG. 279.
V Hi-Par Products Co., Fitchburg, Mass. 15.
Hoffman Radio Corp., 3716 S. Hill St., Los Angeles 7, Calif. 4-5-7-15-17-21-22.
International Television Corp., 238 William St., New York 7, N. Y. 15-17-18-19-20-21-22.
V Jackson Industries, Inc., 58 E. Cullerton St., Chicago 16, Ill. 1-5-15-17-22.
Jamaica Television Mfg. Co., 95-26 Sutphin Blvd., Jamaica 4, N. Y. 15-16-17-20-21-22.
V Kaye-Halbert Corp., 1555 Hayden Ave., Culver City, Calif. 15-17.
V Lasalek Radio Mfg. Co., 1451 Monroe Ave., Wayne, Michigan. 5.
M. P. Concert Installations, Fairfield 10, Conn. 7-15-17-20-24.
V Magnavox Co., The, Components Div., Fort Wayne 4, Indiana. 1-7-17-22.
V Marvision Television & Radio Corp., 845 Broadway, New York 3, N. Y. 4-5-8-15-16-17.
V Mack Industries, John, Liberty at Pennsylvania, Plymouth, Ind. 4-5-15-17-22.
Meissner Mfg. Div., Maguire Industries, Inc., Mt. Carmel, Ill. 4-7-17-23.
Melded Insulation Co., Aircraft Control Div., 335 E. Price St., Philadelphia, Pa. 5-23.
V NATIONAL COMPANY, INC., 61 Sherman St., Malden 48, Mass. 15-17. ADV. PG. 33 to 36.
V National Polytronics, Inc., 2430 Atlantic Ave., Brooklyn, N. Y. 4-5-7-11-15-17-20-21-22.
V Newton Television Corp., Newton Rd., Norwalk, Conn. 15-17.
V Nonett Sparks Industries, Columbus, Indiana. 1-4-5-7-11-15-17-22.
V Olympic Radio & Television, Inc., 34-01 38th Ave., Long Island City, N. Y. 4-5-7-15-17-20-22.
V Onken Corp., The, Electronic Div., 19a Albion Ave., Paterson 2, N. J. 1-2-3-5-24.

Ⓥ Penton, Corp., The, 611 W. Division St., Chicago 10, Ill. 2-3.

Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa. 1-2-3-4-5-7-8-9-10-11-15-17-20-21-22.

Ⓥ Philmore Mfg. Co., 113 University Place, New York 3, N. Y. 15-17-18-19.

Ⓥ Pilot Radio Corp., 37-06 36th St., Long Island City, N. Y. 15-16-17-18-19-20-21-22.

Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. 1-2-4-6-7-11-14-17-20-22. ADV. PG. 73 to 75. Inside Back and Back Covers.

Ⓥ RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. 1-3-4-7-9-11-14-15-16-17-18-20-21-22. ADV. PG. 167.

Ⓥ Remington Radio Corp., 60 Main St., White Plains, N. Y. 18-19.

Ⓥ S. M. A. CO., 4721 N. Ravenswood, Chicago 40, Ill. 7-9-15-17-20-22.

Ⓥ Scott Radio Labs., Inc., 4461 N. Ravenswood Ave., Chicago 40, Ill. 7-9-15-17-20-22.

Sentinel Radio Corp., 2100 Dempster St., Evanston, Ill. 4-5-6-7-8-9-11-15-16-17-20-21-22.

Ⓥ Shevers Inc., Harold, 123 W. 64th St., New York 23, N. Y. 1-2-7-15.

Ⓥ Sightmaster Corp., 20 E. 35th St., New York 16, N. Y. 15-17-18-19-24.

Ⓥ Simpson Mfg. Co., Inc., Mark, 32-38 49th St., Long Island City 3, N. Y. 23.

Ⓥ Sonotone Corp., Elmsford, N. Y. 23.

Ⓥ Soreson Television Co., 5508 New Utrecht Ave., Brooklyn 19, N. Y. 15-17.

Ⓥ Sparton Radio-Television Div., The Spartan Aircraft Co., Jackson, Mich. 4-5-11-15-17-23.

Ⓥ Speak-O-Phone Recording & Equipment Co., 26 W. 60th St., New York, N. Y. 23.

Ⓥ Stewart-Warner Electric Div., Stewart-Warner Corp., 1826 Diversey Pkwy., Chicago 14, Ill. 4-5-7-11-15-17-20-22.

Ⓥ Stolle Engineering & Mfg. Co., 1970 S. Grand Ave., Los Angeles 27, Calif. 15-17.

Ⓥ Stromberg-Carlson Co., Rochester 3, N. Y. 15-17-22.

Ⓥ SYLVANIA ELECTRIC PRODUCTS INC., Radio & Television Div., 254 Rano St., Buffalo 7, N. Y. 2-3-4-5-6-7-8-9-11-15-17-18-20-22. ADV. PG. 286 to 290.

Symphony Radio & Television Corp., 771 S. Mantel Ave., Los Angeles 40, Calif. 1-2-4-5-15-17-18-19-20-21-22-23.

Ⓥ Tele King Corp., 601 W. 26th St., New York 1, N. Y. 22-23.

Ⓥ Tele-Tone Radio Co., 540 W. 58th St., New York 19, N. Y. 4-5-15-16-17.

Ⓥ Telechrome, Inc., 460 North Ave., New Rochelle, N. Y. 15-17-18-19-20-21-23.

Ⓥ Tele-Ler Radio Corp., 571 W. Jackson Blvd., Chicago, Ill. 2-4-5-15.

U. S. Television Mfg. Corp., 3 W. 61st St., New York 23, N. Y. 15-17-18-19-20-22.

Video Corp. of America, 224 W. 29th St., New York 1, N. Y. 15-17-18-19-20-21-22.

Ⓥ Wells-Gardner & Co., 2701 N. Kildare Ave., Chicago 39, Ill. 1-2-3-4-5-7-8-9-11-15-17-22.

Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. 2-3-4-5-7-8-9-10-11-15-17. ADV. PG. 77.

Ⓥ Wilcox-Gay Corp., Charlotte, Mich. 7-15-17-18-19-20-22-23.

Ⓥ Zenith Radio Corp., 6001 Dickens Ave., Chicago 39, Ill. 2-4-11-14-15-17-22.

RECORDERS—*Blood Pressure*

Ⓥ Baldwin Locomotive Works, Philadelphia 42, Pa.
Ⓥ Elder Electronics Co., 207 Main St., Worcester, Mass.
Ⓥ Garrett & Sorrell, Haworth, N. J.
Ⓥ Hathaway Instrument Co., 1315 S. Clarkson St., Denver 10, Colo.
Ⓥ RAHM INSTRUMENTS INC., 17 West Broadway, New York 7, N. Y. ADV. PG. 178.
Ⓥ SANBORN CO., 35 Osborn St., Cambridge 39, Mass. ADV. PG. 119.
Ⓥ Technitrol Engineering Co., 2012 Market St., Philadelphia, Pa.

RECORDERS—*Density*

See Recorders, Specific Gravity

RECORDERS—*Dielectric Constant*

Ⓥ Tech Laboratories, Inc., Bergen & Kinsell Blvds., Palisades Park, N. J.
Ⓥ Thompson & Associates, John E., 7210 S. Yates Ave., Chicago 49, Ill.

RECORDERS—*Electronic Office Recorders & Playbacks*

Ajax King Products Co., Inc., 270 53rd St., Brooklyn, N. Y.
Ⓥ Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.
Ⓥ Crescent Industries, Inc., 4140 Belmont Ave., Chicago 41, Ill.
Ⓥ Dictaphone Corp., 420 Lexington Ave., New York 17, N. Y.
Ⓥ EDISON INC., THOMAS A., 51 Lakeside Ave., West Orange, N. J. ADV. PG. 129.
Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
Ⓥ Gray Mfg. Co., The, 16 Arbor St., Hartford, Conn.
Ⓥ LAVOIE LABORATORIES, Morganville, N. J. ADV. PG. 151.
Lekas Mfg. Co., Ann Arbor, Mich.
Ⓥ MILES REPRODUCER CO., INC., 812 Broadway, New York 3, N. Y. ADV. PG. 275.
Ⓥ Penton Corp., The, 611 W. Division St., Chicago 10, Ill.
Ⓥ Press Wireless Mfg. Co., Inc., Cantiague Rd., Hicksville, L. I., N. Y.
Ⓥ Speak-O-Phone Recording & Equipment Co., 26 W. 60th St., New York, N. Y.
Ⓥ Telechronics Corp., 8479 Higuera St., Culver City, Calif.
Ⓥ Wireway Corp. of America, 1331 Halsey St., Brooklyn 27, N. Y.

RECORDERS—*Electronic Rotary Stylus*

Ⓥ Fielden Electronics Inc., 1171 New York Ave., Huntington Station, N. Y.
Ⓥ MILES REPRODUCER CO., INC., 812 Broadway, New York 3, N. Y. ADV. PG. 275.

RECORDERS—*Electronic Self-Balancing Recorders and Indicators*

Ⓥ Airborne Instruments Lab., Inc., 160 Old Country Rd., Mineola, L. I., N. Y.
Ⓥ Antenna Research Lab., Inc., 997 Thomas Lane, Columbus 9, Ohio.
Ⓥ Baldwin Locomotive Works, Philadelphia 42, Pa.
Ⓥ Esi Instrument Co., 96 So. Washington Ave., Bergenfield, N. J.
Ⓥ FLADER INC., FREDERIC, North Tonawanda, N. Y. ADV. PG. 240.
Ⓥ Foxboro Co., The, Foxboro, Mass.
Ⓥ Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
Ⓥ Marconi Instruments, Ltd., 23 Beaver St., New York 4, N. Y.
Ⓥ Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Roberts Aves., Philadelphia 44, Pa.
Ⓥ Schoeltz Engineering, Crescent Blvd. at Drexel Ave., Pennsauken Township, Camden 11, N. J.
Ⓥ Thwing-Albert Instrument Co., 5451 Pulaski Ave., Philadelphia 44, Pa.

RECORDERS—*Facsimile*

Ⓥ Acme Telotronix Div. of NEA Service, Inc., West Third & Lakeside, Cleveland 13, Ohio.
Ⓥ ALDEN PRODUCTS CO., 117 No. Main St., Brockton 64, Mass. ADV. PG. 236.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Finch Mfg. Co., Inc., 528 E. 72nd St., New York, N. Y.
Ⓥ Fairchild Recording Equipment Corp., 154th St. & 7th Ave., Whitestone, N. Y.
Ⓥ Hogan Laboratories, Inc., 155 Perry St., New York 14, N. Y.
McElroy Mfg. Corp., Lexington, Mass.
Ⓥ MUIRHEAD & CO., LTD., Beckenham, Kent, England. ADV. PG. 111.
Ⓥ Press Wireless Mfg. Co., Inc., Cantiague Rd., Hicksville, L. I., N. Y.
Ⓥ TIMES FACSIMILE CORP., 329 W. 43rd St., New York 18, N. Y. ADV. PG. 50.

RECORDERS—*Film*

Ⓥ Acme Telotronix Div. of NEA Service, Inc., West Third & Lakeside, Cleveland 13, Ohio.
Arlington Electric Products, Inc., 500 W. 52nd St., New York 19, N. Y.
Berndt-Bach, Inc., 7377 Beverly Blvd., Los Angeles 36, Calif.
Ⓥ Bioinstrumentor Company, 12 River St., Boston, Mass.
Ⓥ Fein Engineering Co., 2601 S. Federal Pl., Chicago 16, Ill.
Hurt & Co., Inc., Frederick, 849 Main Ave., Poughkeepsie, N. Y.
Ⓥ Hathaway Instrument Co., 1315 S. Clarkson St., Denver 10, Colo.
Ⓥ HEILAND RESEARCH CORP., 130 E. 5th Ave., Denver 9, Colo. ADV. PG. 242.
Ⓥ Maurer Inc., J. A., 37-01 31st St., Long Island City, N. Y.
Ⓥ MILES REPRODUCER CO., INC., 812 Broadway, New York 3, N. Y. ADV. PG. 275.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 75. Inside Back and Back Covers.
Ⓥ Stanzel-Hoffman Corp., 1016 N. Highland Ave., Hollywood 38, Calif.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

RECORDERS—*Film Thickness*

Ⓥ Tracerlab, Inc., 130 High St., Boston 10, Mass.

RECORDERS—*Fluid Conductivity*

Ⓥ Bailey Meter Co., 1044 Ivanhoe Rd., Cleveland 10, Ohio.
Ⓥ Foxboro Co., The, Foxboro, Mass.
Ⓥ Industrial Instruments Inc., 17 Pollack Ave., Jersey City 5, N. J.
Ⓥ Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
Ⓥ Marconi Instruments, Ltd., 23 Beaver St., New York 4, N. Y.
Ⓥ Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Roberts Aves., Philadelphia 44, Pa.
Ⓥ Thompson & Associates, John E., 7210 S. Yates Ave., Chicago 49, Ill.

RECORDERS—*Fluid Flow*

Ⓥ Autocall Co., The, Shelby, Ohio.
Ⓥ Bailey Meter Co., 1044 Ivanhoe Rd., Cleveland 10, Ohio.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ Fischer & Porter Co., Hatboro, Pa.
Ⓥ Foxboro Co., The, Foxboro, Mass.
Ⓥ Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
Ⓥ Leupold & Stevens Instruments, Inc., 4445 N.E. Glisan St., Portland 13, Ore.
Ⓥ Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Roberts Aves., Philadelphia 44, Pa.

RECORDERS—*Frequency*

Ⓥ Esterline-Angus Co., Inc., P. O. Box 596, Indianapolis 6, Ind.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
Ⓥ POTTER INSTRUMENT CO., INC., 115 Cutter Mill Rd., Great Neck, N. Y. ADV. PG. 204.
Ⓥ SOUND APPARATUS CO., Stirling, N. J. ADV. PG. 243.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

RECORDERS—*Humidity*

American Instrument Co., 8010 Georgia Ave., Silver Spring, Md.
Ⓥ Bristol Co., The, Waterbury 20, Conn.
Ⓥ Fielden Electronics Inc., 1171 New York Ave., Huntington Station, N. Y.
Ⓥ Foxboro Co., The, Foxboro, Mass.
Ⓥ Friez Instrument Div., Bendix Aviation Corp., Baltimore 4, Md.
Ⓥ Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
Ⓥ Manning, Maxwell & Moore, Inc., Stratford, Conn.
Ⓥ Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Roberts Aves., Philadelphia 44, Pa.
Serdex Inc., 91 Cambridge St., Boston, Mass.

RECORDERS—*Liquid Level*

Ⓥ Autocall Co., The, Shelby, Ohio.
Ⓥ Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.
Ⓥ Bailey Meter Co., 1044 Ivanhoe Rd., Cleveland 10, Ohio.
Ⓥ Bristol Co., The, Waterbury 20, Conn.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ Esterline-Angus Co., Inc., P. O. Box 596, Indianapolis 6, Ind.
Ⓥ Fischer & Porter Co., Hatboro, Pa.
Fisher Research Lab., 1961 University Ave., Palo Alto, Calif.
Ⓥ Foxboro Co., The, Foxboro, Mass.
Ⓥ Friez Instrument Div., Bendix Aviation Corp., Baltimore 4, Md.
Ⓥ Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
Leupold & Stevens Instruments, Inc., 4445 N. E. Glisan St., Portland 13, Ore.
Ⓥ Manning, Maxwell & Moore, Inc., Stratford, Conn.
Ⓥ Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Roberts Aves., Philadelphia 44, Pa.
Ⓥ SERVO-TEK PRODUCTS CO., 4 Godwin Ave., Paterson, N. J. ADV. PG. 187.

RECORDERS—*Magnetic Tape*

Ⓥ Ampex Electric Corp., 1155 Howard Ave., San Carlos, Calif.
Ⓥ Amplifier Corp. of America, 396 Broadway, New York 13, N. Y.
Arlington Electric Products, Inc., 500 W. 52nd St., New York 19, N. Y.
Ⓥ Audiograph Co., 1414 El Camino Real, San Carlos, Calif.
Audio Master Co., 23 W. 45th St., New York 19, N. Y.
Ⓥ Bell Sound Systems, Inc., 555 Marion Rd., Columbus 7, Ohio.
Ⓥ Brellant Associates, 4917 W. Jefferson Blvd., Los Angeles 16, Calif.
Broadcasting Program Service, 23 W. 45th St., New York 19, N. Y.

V indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

V CINEMA ENGINEERING CO., 1510 W. Verdugo Ave., Burbank, Calif. ADV. PG. 166.
Esser, Inc., 1501 W. Congress St., Chicago 7, Ill.
V Fairchild Recording Equipment Corp., 154th St. & 7th Ave., Whitestone, N. Y.
V Feller Engineering Co., 1601 S. Federal St., Chicago 16, Ill.
V Gates Radio Co., Quincy, Ill.
V General Communication Co., 830 Commonwealth Ave., Boston 15, Mass.
V General Industries Co., Taylor & Olive Sts., Elyria, Ohio.
Lewis Mfg. Co., Ann Arbor, Mich.
V MAGNECORD, INC., 360 N. Michigan Ave., Chicago 1, Ill. ADV. PG. 187.
V Magnetic Recorders Co., 7120 Melrose St., Los Angeles, Calif.
V Maurer, Inc., J. A., 37-01 31st St., Long Island City, N. Y.
Molded Insulation Co., Aircraft Control Div., 335 E. Price St., Phila., Pa.
V Operadio Mfg. Co., 135th & Indiana Sts., St. Charles, Ill.
V Pentron Corp., The, 611 W. Division St., Chicago 10, Ill.
V Permo-Flux Corp., 4900 W. Grand Ave., Chicago 39, Ill.
V Press Wireless Mfg. Co., Inc., Centlivre Rd., Hicksville, L. I., N. Y.
V PRESTO RECORDING CORP., Paramus, N. J. ADV. PG. 94, 95.
Process & Instruments, 60 Greenpoint Ave., Brooklyn 22, N. Y.
V Proctor Shoales Corp., 113 N. 6th Ave., Mt. Vernon, N. Y.
V RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 75. Inside Back and Back Covers.
V Simpson Mfg. Co., Inc., Mark, 32-28 49th St., Long Island City 3, N. Y.
V Speak-O-Phone Recording & Equipment Co., 23 W. 60th St., New York, N. Y.
V Stancil-Hoffman Corp., 1016 N. Highland Ave., Hollywood 38, Calif.
V Webster Electric Co., 1900 Clark St., Racine, Wis.
V Wilcox-Gay Corp., Charlotte, Michigan.
V Wireless Corp. of America, 1331 Halsey St., Brooklyn 27, N. Y.

RECORDERS—*Materials Thickness*

V Electric Eye Equipment Co., 16 W. Fairchild St., Danville, Ill.
V Foxboro Co., The, Foxboro, Mass.
V Schaevitz Engineering, Crescent Blvd. at Drexel Ave., Pennsauken Township, Camden 11, N. J.
V Tracerlab, Inc., 130 High St., Boston 10, Mass.

RECORDERS—*Mechanical*

V Amis Co., R. B., 1101 N. Delaware St., Indianapolis, Ind.
V Autocall Co., The, Shelby, Ohio.
V Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.
V Bristol Co., The, Waterbury 20, Conn.
V Burrell & Co., J. H., 61 Prospect St., Brooklyn, N. Y.
V Charleston Specialties Co., Moraga 8, Calif.
V FLADER, INC., FREDERIC, North Tonawanda, N. Y. ADV. PG. 240.
V Gorrell & Gorrell, Epworth, N. J.
Streeter-Amet Corp., 4101 N. Rockwell Ave., Chicago 18, Ill.
West Coast Electronics Co., 1601 S. Burlington St., Los Angeles 6, Calif.

RECORDERS—*Moisture*

V Hasler Electronics Inc., 1171 New York Ave., Huntington Station, N. Y.
V Foxboro Co., The, Foxboro, Mass.
V Manning, Maxwell & Moore, Inc., Stratford, Conn.
V Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Roberts Aves., Philadelphia 44, Pa.

RECORDERS—*Nuclear Radiation*

V Anton Electronic Laboratories, Inc., 3226-3228 Tiebout Ave., Bronx 67, N. Y.
V Applied Physics Corp., 30 W. Green St., Pasadena 1, Calif.
V ATOMIC INSTRUMENT CO., 140 Charles St., Boston, Mass. ADV. PG. 258.
V Bendix (Canada) Ltd., 302-304 Wilson St., Hamilton, Ont., Canada.
V Electronic Specialties Co., Moraga 8, Calif.
V Electronic Products Co., 411 E. 168 St., Mt. Vernon, N. Y.
V ELECTRONICS, INC., 1638 N. Howard St., Philadelphia 22, Pa. ADV. PG. 208.
V Geophysical Instrument Co., 1610 N. Nash St., Arlington, Va.
V North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
V Nuclear Instrument & Chemical Corp., 224 W. Erie St., Chicago 10, Ill.
V Nucleonic Corp., of America, The, 497 Union St., Brooklyn 31, N. Y.
V POTTER INSTRUMENT CO., INC., 115 Cutter Mill Rd., Great Neck, N. Y. ADV. PG. 204.
V Radioactive Products, Inc., 3201 E. Woodbridge St., Detroit 7, Mich.
V Special Instruments Laboratory, Inc., 1003 Highland Ave., Knoxville, Tenn.
V Tracerlab, Inc., 130 High St., Boston 10, Mass.

RECORDERS—*Oxygen*

V Bailey Meter Co., 1044 Ivanhoe Rd., Cleveland 10, Ohio.
V Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
V Minneapolis-Honeywell Regulator Co., 2753 Fourth Ave., S., Minneapolis, Minn.

RECORDERS—*pH*

V Bailey Meter Co., 1044 Ivanhoe Road, Cleveland 10, Ohio.
V Bristol Co., The, Waterbury 20, Conn.
Fisher Research Lab., 1961 University Ave., Palo Alto, Calif.
V Foxboro Co., The, Foxboro, Mass.
V Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
V Manson Instruments, Ltd., 23 Beaver St., New York 4, N. Y.
V Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Roberts Aves., Philadelphia 44, Pa.
V WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

RECORDERS—*Potentiometer*

V Bailey Meter Co., 1044 Ivanhoe Rd., Cleveland 10, Ohio.
V Bristol Co., The, Waterbury 20, Conn.
V Electronic Associates, Inc., Long Branch, N. J.
V Foxboro Co., The, Foxboro, Mass.
V Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
V Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Roberts Aves., Philadelphia 44, Pa.
V North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
V SOUND APPARATUS CO., Stirling, N. J. ADV. PG. 241.
V Thwing Albert Instrument Co., 5351 Pulaski Ave., Philadelphia 44, Pa.

RECORDERS—*Power Level*

V Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.
V SOUND APPARATUS CO., Stirling, N. J. ADV. PG. 241.

RECORDERS—*Pressure*

V Autocall Co., The, Shelby, Ohio.
V Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.
V Bailey Meter Co., 1044 Ivanhoe Road, Cleveland 10, Ohio.
V Bristol Co., The, Waterbury 20, Conn.
V Control Engineering Corp., 863 Washington St., Canton, Mass.
V Electro Products Labs., Inc., 549 W. Randolph St., Chicago 6, Ill.
V Esterline Angus Co., Inc., P. O. Box 596, Indianapolis 6, Ind.
V Fischer & Porter Co., Hatboro, Pa.
FLADER, INC., FREDERIC, North Tonawanda, N. Y. ADV. PG. 240.
V Foxboro Co., The, Foxboro, Mass.
V Frost Instrument Div., Bendix Aviation Corp., Baltimore 4, Md.
V Hathaway Instrument Co., 1315 S. Clarkson St., Denver 10, Colo.
V Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
V Manning, Maxwell & Moore, Inc., Stratford, Conn.
V Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Roberts Aves., Philadelphia 44, Pa.
V SANBORN CO., 39 Osborn St., Cambridge 39, Mass. ADV. PG. 219.
Servo, Inc., 90 Cambridge St., Boston, Mass.
V Technical Engineering Co., 5212 Market St., Philadelphia, Pa.
V WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

RECORDERS—*Smoke and Combustion*

V Bailey Meter Co., 1044 Ivanhoe Rd., Cleveland 10, Ohio.
V Bristol Co., The, Waterbury 20, Conn.
V Combustion Control Corp., 77 Broadway, Cambridge 42, Mass.
V Esterline Angus Co., Inc., 915 Washington Ave., Bergenfield, N. J.
V GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 9 to 18.
V Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
V Minneapolis-Honeywell Regulator Co., 2753 Fourth Avenue, S., Minneapolis, Minn.
V Photoelectric Inc., 77 Broadway, Cambridge 42, Mass.

RECORDERS—*Sound Level*

V BRUSH DEVELOPMENT CO., 3405 Perkins Ave., Cleveland 14, Ohio. ADV. PG. 124, 125.
V Fairchild Recording Equipment Corp., 154th St. & 7th Avenue, Whitestone, N. Y.
V KAY ELECTRIC CO., 14 Maple Ave., Pine Brook, N. J. ADV. PG. 193.
V SOUND APPARATUS CO., Stirling, N. J. ADV. PG. 241.

RECORDERS—*Sound and Phonograph*

Arlington Electric Products, Inc., 500 W. 52nd St., New York 19, N. Y.
V Audak Co., 500 Fifth Ave., New York, N. Y.
V Audio Industries, Michigan City, Ind.
V Bernat-Bach, Inc., 7377 Beverly Blvd., Los Angeles 36, Calif.
V Cook Laboratories, 139 Gordon Blvd., Floral Park, N. Y.
V Fada Radio & Electric Co., Inc., 525 Main St., Belleville, N. J.
V Fairchild Recording Equipment Corp., 154th St. & 7th Ave., Whitestone, N. Y.
V Feller Engineering Co., 1601 S. Federal St., Chicago 16, Ill.
V KAY ELECTRIC CO., 14 Maple Ave., Pine Brook, N. J. ADV. PG. 193.
V Maurer, Inc., J. A., 37-01 31st St., Long Island City, N. Y.
Meissner Mfg. Div., Maguire Industries, Inc., Mt. Carmel, Ill.
V MILES REPRODUCER CO., INC., 812 Broadway, New York 3, N. Y. ADV. PG. 275.
Mirror Record Corp., 1133 Broadway, New York 10, N. Y.
V PRESTO RECORDING CORP., Paramus, N. J. ADV. PG. 94, 95.
V RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 75. Inside Back and Back Covers.
V Rek-O-Kut Co., Inc., 39-01 Queens Blvd., Long Island City, N. Y.
Scully Machine Co., 62 Walter St., Bridgeport, Conn.
V Simpson Mfg. Co., Inc., Mark, 32-28 49th St., Long Island City 3, N. Y.
V Soundscriber Corp., 146 Munson St., New Haven 4, Conn.
V Speak-O-Phone Recording & Equipment Co., 23 W. 60th St., New York, N. Y.
V Webster Chicago Corp., 5622 Bloomingdale Ave., Chicago 39, Ill.
West Coast Electronics Co., 1601 S. Burlington St., Los Angeles 6, Calif.
V Wilcox-Gay Corp., Charlotte, Michigan.
V Wireless Corp. of America, 1331 Halsey St., Brooklyn 27, N. Y.

RECORDERS—*Specific Gravity*

V Esi Instrument Co., 96 S. Washington Ave., Bergenfield, N. J.
V Fischer & Porter Co., Hatboro, Pa.
V Foxboro Co., The, Foxboro, Mass.
V Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
V Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Roberts Ave., Philadelphia 44, Pa.

RECORDERS—*Strain*

V Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.
V Baldwin Locomotive Works, Philadelphia 42, Pa.
V Bendix Aviation Corp., Pacific Division, 11600 Sherman Way, N. Hollywood, Calif.
V BRUSH DEVELOPMENT CO., 3405 Perkins Ave., Cleveland 14, Ohio. ADV. PG. 124, 125.
V CENTURY GEOPHYSICAL CORP., 133 N. Utica, Tulsa 19, Okla. ADV. PG. 237.
V Cox, Inkstructograph, 1320 S. Grand Ave., Los Angeles 15, Calif.
V Consolidated Engineering Corp., 620 Lake Ave., Pasadena 4, Calif.
V Kin Electronics Co., 202 Main St., Worcester, Mass.
V ELECTRONIC TUBE CORP., 1200 E. Mermaid Lane, Philadelphia 18, Pa. ADV. PG. 156.
V Ferry Associates, Box 77, Pelham 65, N. Y.
V Foxboro Co., The, Foxboro, Mass.
V Hathaway Instrument Co., 1315 S. Clarkson St., Denver 10, Colo.
V HEILAND RESEARCH CORP., 130 E. 4th Ave., Denver 9, Colo. ADV. PG. 242.
V Minneapolis-Honeywell Regulator Co., 2753 Fourth Avenue, S., Minneapolis, Minn.
V RAHM INSTRUMENTS INC., 12 West Broadway, New York 7, N. Y. ADV. PG. 194.

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

Ⓥ SANBORN CO., 39 Osborn St., Cambridge 39, Mass. ADV. PG. 219.
Ⓥ Southwestern Industrial Electronic Co., 2831 Post Oak Rd., Houston 19, Texas.

RECORDERS—*Tape*

Airborne Instruments Lab., Inc., 160 Old Country Rd., Mineola, L. I., N. Y.
Ⓥ Ampex Electric Corp., 1155 Howard Ave., San Carlos, Calif.
Ⓥ Ampro Corp., 2835 North Western Ave., Chicago 18, Ill.
Arlington Electric Products Inc., 500 W. 52nd St., New York 19, N. Y.
Ⓥ Berlant Associates, 4917 W. Jefferson Blvd., Los Angeles 16, Calif.
Ⓥ BRUSH DEVELOPMENT CO., 3405 Perkins Ave., Cleveland 14, Ohio. ADV. PG. 124, 125.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ Cook Electric Co., 2700 Southport Ave., Chicago 14, Ill.
Electronic Workshop, Inc., 351 Bleecker St., New York 14, N. Y.
Ⓥ Fairchild Recording Equipment Corp., 154th St. & 7th Avenue, Whitestone, N. Y.
Ⓥ Feiler Engineering Co., 1601 S. Federal St., Chicago 16, Ill.
Ⓥ Gale Dorothea Mechanisms, 37-61 85th St., Jackson Heights, L. I., N. Y.
Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 14.
Ⓥ General Industries Co., Taylor & Olive Sts., Elyria, Ohio.
Lekas Mfg. Co., Ann Arbor, Mich.
Ⓥ McElroy Mfg. Corp., Littleton, Mass.
Ⓥ MAGNECORD, INC., 360 N. Michigan Ave., Chicago 1, Ill. ADV. PG. 187.
Molded Insulation Co., Aircraft Control Div., 335 E. Price St., Philadelphia, Pa.
Ⓥ National Polytronics, Inc., 2430 Atlantic Ave., Brooklyn, N. Y.
Ⓥ Operadio Mfg. Co., 155th & Indiana Sts., St. Charles, Ill.
Ⓥ Pentron Corp., The, 611 W. Division St., Chicago 10, Ill.
Ⓥ Permoflux Corp., 4900 W. Grand Ave., Chicago 39, Ill.
Ⓥ PRESTO RECORDING CORP., Paramus, N. J. ADV. PG. 94, 95.
Process & Instruments, 60 Greenpoint Ave., Brooklyn 22, N. Y.
Ⓥ Proctor Soundex Corp., 133 N. 6th Ave., Mt. Vernon, N. Y.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 75. Inside Back and Back Covers.
Ⓥ Remington, Inc., 73 Winthrop St., Newark 4, N. J.
Ⓥ SONAR RADIO CORP., 59 Myrtle Ave., Brooklyn 2, N. Y. ADV. PG. 204.
Ⓥ Speak-O-Phone Recording & Equipment Co., 23 W. 60th St., New York, N. Y.
Stancil-Hoffman Corp., 1016 N. Highland Ave., Hollywood, Calif.
Ⓥ Wilcox-Gay Corp., Charlotte, Michigan.

RECORDERS—*Telemetering*

Ⓥ Ampex Electric Corp., 1155 Howard Ave., San Carlos, Calif.
Applied Science Corp. of Princeton, The, P. O. Box 44, Princeton, N. J.
Arlington Electric Products Inc., 500 W. 52nd St., New York 19, N. Y.
Ⓥ Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.
Ⓥ Bailey Meter Co., 1044 Ivanhoe Road, Cleveland 10, Ohio.
Ⓥ Bristol Co., The, Waterbury 20, Conn.
Ⓥ Clarke Instrument Corp., 910 King St., Silver Spring, Md.
Ⓥ Esterline-Angus Co., Inc., P. O. Box 596, Indianapolis 6, Ind.
Ⓥ Fischer & Porter Co., Hatboro, Pa.
Ⓥ Friez Instrument Div., Bendix Aviation Corp., Baltimore 4, Md.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 14.
Ⓥ Hathaway Instrument Co., 1315 S. Clarkson St., Denver 10, Colo.
Ⓥ HEILAND RESEARCH CORP., 130 E. 5th Ave., Denver 9, Colo. ADV. PG. 242.
Ⓥ Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
Ⓥ Leupold & Stevens Instruments, Inc., 4445 N. E. Glisan St., Portland 13, Ore.
Ⓥ Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Roberts Aves., Philadelphia 44, Pa.
Ⓥ SANBORN CO., 39 Osborn St., Cambridge 39, Mass. ADV. PG. 219.
Ⓥ Stancil-Hoffman Corp., 1016 N. Highland Ave., Hollywood, Calif.
Ⓥ Thompson & Associates, John E., 7210 Yates Ave., Chicago 49, Ill.
West Coast Electronics Co., 1601 S. Burlington St., Los Angeles 6, Calif.

RECORDERS—*Telephone Recording Equipment*

Ⓥ BRUSH DEVELOPMENT CO., 3405 Perkins Ave., Cleveland 14, Ohio. ADV. PG. 124, 125.
Ⓥ Dictaphone Corp., 420 Lexington Ave., New York 17, N. Y.
Ⓥ EDISON INC., THOMAS A., 51 Lakeside Ave., West Orange, N. J. ADV. PG. 129.
Hart & Co., Inc., Frederick, 839 Main Ave., Poughkeepsie, N. Y.
Ⓥ MILES REPRODUCER CO., INC., 812 Broadway, New York 3, N. Y. ADV. PG. 275.
Ⓥ Peirce Wire Recorder Corp., 1328 Sherman Ave., Evanston, Ill.
Ⓥ Soundscriber Corp., 146 Munson St., New Haven 4, Conn.
Ⓥ Speak-O-Phone Recording & Equipment Co., 23 W. 60th St., New York, N. Y.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ Teletronics Corp., 8479 Higuera St., Culver City, Calif.
Ⓥ Wilcox-Gay Corp., Charlotte, Michigan.
Ⓥ Wireway Corp. of America, 1331 Halsey St., Brooklyn 27, N. Y.

RECORDERS—*Temperature*

Ⓥ Autocall Co., The, Shelby, Ohio.
Ⓥ Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.
Ⓥ Bailey Meter Co., 1044 Ivanhoe Road, Cleveland 10, Ohio.
Ⓥ Bristol Co., The, Waterbury 20, Conn.
Ⓥ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ Fischer & Porter Co., Hatboro, Pa.
Fisher Research Lab., 1961 University Ave., Palo Alto, Calif.
Ⓥ Foxboro Co., The, Foxboro, Mass.
Ⓥ Friez Instrument Div., Bendix Aviation Corp., Baltimore 4, Md.
Ⓥ Gordon Co., Claud S., 3000 S. Wallace St., Chicago 16, Ill.
Ⓥ Hathaway Instrument Co., 1315 S. Clarkson St., Denver 10, Colo.
Ⓥ Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
Ⓥ Manning, Maxwell & Moore, Inc., Stratford, Conn.
Ⓥ Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Roberts Aves., Philadelphia 44, Pa.
Ⓥ SANBORN CO., 39 Osborn St., Cambridge 39, Mass. ADV. PG. 219.
Serdex, Inc., 91 Cambridge St., Boston, Mass.
Ⓥ Thwing-Albert Instrument Co., 5351 Pulaski Ave., Philadelphia 44, Pa.
Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.
Ⓥ Wheelco Instruments Co., 847 W. Harrison St., Chicago 7, Ill.

RECORDERS—*Timing*

Ⓥ Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.
Ⓥ Cyclatron Specialties Co., Moraga 8, Calif.
Engineering Lab., Inc., 602 E. 4th St., Tulsa 3, Okla.
Ⓥ Esterline-Angus Co., Inc., P. O. Box 596, Indianapolis, Ind.
Ⓥ Gorrell & Gorrell, Haworth, N. J.
Ⓥ Hathaway Instrument Co., 1315 S. Clarkson St., Denver 10, Colo.
Ⓥ POTTER INSTRUMENT CO., INC., 115 Cutter Mill Rd., Great Neck, N. Y. ADV. PG. 204.
Ⓥ Sheffield Instrument Corp., 2021 N. Lincoln St., Burbank, Calif.
Ⓥ Special Instruments Laboratory, Inc., 1003 Highland Ave., Knoxville, Tenn.
Streeter-Amet Corp., 4101 N. Ravenswood Ave., Chicago 13, Ill.

RECORDERS—*Torque*

Ⓥ Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.
Ⓥ Baldwin Locomotive Works, Philadelphia 42, Pa.
Ⓥ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ Hathaway Instrument Co., 1315 S. Clarkson St., Denver 10, Colo.
Ⓥ SANBORN CO., 39 Osborn St., Cambridge 39, Mass. ADV. PG. 219.

RECORDERS—*Vacuum*

Ⓥ Bailey Meter Co., 1044 Ivanhoe Rd., Cleveland 10, Ohio.
Ⓥ Bristol Co., The, Waterbury 20, Conn.
Ⓥ Control Engineering Corp., 863 Washington St., Canton, Mass.
Ⓥ Distillation Products Industries, Vacuum Equipment Div., 755 Ridge Rd., W., Rochester 3, N. Y.
Ⓥ Esterline-Angus Co., Inc., P. O. Box 596, Indianapolis 6, Ind.
Ⓥ Foxboro Co., The, Foxboro, Mass.
Ⓥ Fredericks Co., Geo. E., Bethayres, Pa.
Ⓥ Hathaway Instrument Co., 1315 S. Clarkson St., Denver 10, Colo.
Ⓥ Manning, Maxwell & Moore, Inc., Stratford, Conn.
Ⓥ Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Roberts Aves., Philadelphia 44, Pa.
Ⓥ National Research Corp., 70 Memorial Drive, Cambridge 42, Mass.
Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

RECORDERS—*Weight*

Ⓥ Baldwin Locomotive Works, Philadelphia 42, Pa.
Ⓥ Foxboro Co., The, Foxboro, Mass.
Ⓥ Hathaway Instrument Co., 1315 S. Clarkson St., Denver 10, Colo.
Ⓥ SERVO-TEK PRODUCTS CO., 4 Godwin Ave., Paterson, N. J. ADV. PG. 187.

RECORDERS—*Wire*

Air-King Products Co., Inc., 170 53rd St., Brooklyn, N. Y.
Ⓥ Audiograph Co., 1414 El Camino Real, San Carlos, Calif.
Ⓥ BRUSH DEVELOPMENT CO., 3405 Perkins Ave., Cleveland 14, Ohio. ADV. PG. 124, 125.
Ⓥ Crescent Industries, Inc., 4140 Belmont Ave., Chicago 41, Ill.
Electro Engineering & Mfg. Co., 627 W. Alexandrine, Detroit 1, Mich.
Electronic Products Div., Epco Products, Inc., 2430 Atlantic Ave., Brooklyn 33, N. Y.
Ⓥ Lear, Inc., 110 Ionia Ave., N.W., Grand Rapids 2, Mich.
Ⓥ MILES REPRODUCER CO., INC., 812 Broadway, New York 3, N. Y. ADV. PG. 275.
Mirror Record Corp., 1133 Broadway, New York 10, N. Y.
Molded Insulation Co., Aircraft Control Div., 335 E. Price St., Philadelphia, Pa.
Ⓥ National Polytronics, Inc., 2430 Atlantic Ave., Brooklyn, N. Y.
Ⓥ Peirce Wire Recorder Corp., 1328 Sherman Ave., Evanston, Ill.
Ⓥ Pentron Corp., 611 W. Division St., Chicago 10, Ill.
Ⓥ Recordisc Corp., 395 Broadway, New York, N. Y.
Ⓥ Speak-O-Phone Recording & Equipment Co., 23 W. 60th St., New York, N. Y.
Ⓥ Webster-Chicago Corp., 5622 Bloomingdale Ave., Chicago 39, Ill.
Ⓥ Wireway Corp. of America, 1331 Halsey St., Brooklyn 27, N. Y.

RECORDING HEADS

See Heads, Recording

RECORDS—*Phonograph*

Audio Master Co., 23 W. 45th St., New York 19, N. Y.
Broadcasting Program Service, 23 W. 45th St., New York 19, N. Y.
Ⓥ Cook Laboratories, 139 Gordon Blvd., Floral Park, N. Y.
Ⓥ Decca Records, Inc., 50 West 57th St., New York 19, N. Y.
Ⓥ Poimettia Co., Inc., 95 Cedar Ave., Pitman, N. J.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 75. Inside Back and Back Covers.
Riggs & Jeffreys, Inc., 140 Glenridge Ave., Montclair, N. J.
Ⓥ Schott Co., Walter L., 9306 Santa Monica Blvd., Beverly Hills, Calif.
Ⓥ Speak-O-Phone Recording & Equipment Co., 23 W. 60th St., New York, N. Y.
Stephens Mfg. Corp., 8538 Warner Drive, Culver City, Calif.
Ⓥ Tempo Record Co. of America, 8540 Sunset Blvd., Hollywood 46, Calif.
Ⓥ Wilcox-Gay Corp., Charlotte, Michigan.

RECTIFIERS—*Crystal*

Ⓥ Kemtron Electron Products, Inc., 23 Brown St., Salem, Mass.
Ⓥ SYLVANIA ELECTRIC PRODUCTS, INC., 1740 Broadway, New York 19, N. Y. ADV. PG. 286 to 290.

RECTIFIERS—*Copper Oxide, Copper Sulphide or Selenium*

See Rectifiers—Metallic

RECTIFIERS—*Metallic*

Ⓥ AMERICAN TELEVISION & RADIO CO., 300 E. Fourth St., St. Paul 1, Minn. ADV. PG. 275.
Ⓥ BRADLEY LABS., INC., 82 Meadow St., New Haven 10, Conn. ADV. PG. 152.
Ⓥ Clark Electronic Labs., Box 165, Palm Springs, Calif.
Ⓥ Conant Labs., 6500 O St., Lincoln 5, Nebr.
Electricraft Transformer Co., Westerly Rd., Ossining, N. Y.

V indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

Electron Equipment Corp., 917 Meridian Ave., South Pasadena, Calif.
V Electronic Controls Co. of New York, 9124 Avenue L, Brooklyn 10, N. Y.
V Electronics West Mfr. Inc., 137 N. East St., Indianapolis, Ind.
V Fansteel Metallurgical Corp., 2200 Sheridan Rd., North Chicago, Ill.
V FEDERAL TELEPHONE AND RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.
V GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
V Green Electric Co., W., 230 Lodge St., New York, N. Y.
V International Rectifier Corp., 6809 S. Victoria Ave., Los Angeles 43, Calif.
V KOTRON RECTIFIER CORP., A Standard Arcturus Affiliate, 54 Clark St., Newark 4, N. J. ADV. PG. 249.
V Mallory & Co., Inc., P. R., 3029 E. Washington St., Indianapolis 6, Ind.
V McColpin-Christie Corp., 3922 S. Figueroa St., Los Angeles 37, Calif.
Metal Products, Inc., 22 E. Hennepin Ave., Minneapolis 1, Minn.
V Metaphone Corp., Rochester 2, N. Y.
V MODEL RECTIFIER CORP., 1510 Nostrand Ave., Brooklyn 26, N. Y. ADV. PG. 275.
V OPAD-GREEN CO., 71 Warren St., New York 7, N. Y. ADV. PG. 274.
V RADIO RECEPTOR CO., 251 W. 19th St., New York 11, N. Y. ADV. PG. 268.
V Rectifier Engineering Co., 1803 E. Seventh St., Los Angeles 21, Calif.
Richardson Allen Corp., 15 W. 20th St., New York 11, N. Y.
V Sarkes Tarzian Inc., 415 N. College Ave., Bloomington, Ind.
V Schauer Mfg. Corp., 2119 Reading Rd., Cincinnati 2, Ohio.
V Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
V STANDARD TRANSFORMER CORP., Elston, Keeler & Addison, Chicago 18, Ill. ADV. PG. 62.
V SYLVANIA ELECTRIC PRODUCTS, INC., 1740 Broadway, New York 19, N. Y. ADV. PG. 286 to 296.
V Thor Electric & Machine Works, 15 S. Jefferson St., Chicago, Ill.
V Vickers Electric Div., Vickers, Inc., 1815 Locust St., St. Louis 3, Mo.
V WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
V Z & W Machine Products Inc., Electronics Div., 4151 St. Clair Ave., Cleveland 3, Ohio.

RECTIFIERS—*Tube Rectifying Units*

American Communications Corp., 104 Broadway, New York 7, N. Y.
V AMERICAN TELEVISION & RADIO CO., 300 E. 4th St., St. Paul 1, Minn. ADV. PG. 270.
V Amperex Electronic Corp., 25 Washington St., Brooklyn 1, N. Y.
Electronic Transformer Co., Beverly Rd., Dunellen, N. J.
Electron Equipment Corp., 917 Meridian Ave., South Pasadena, Calif.
V Eitel-McCullough, Inc., 301 Jefferson St., Chicago 6, Ill.
V GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
V GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
V McColpin-Christie Corp., 3922 S. Figueroa St., Los Angeles 37, Calif.
V Metaphone Corp., Rochester 2, N. Y.
V National Spectrographic Laboratories Inc., 6300 Euclid Ave., Cleveland 3, Ohio.
Northeastern Engineering, Inc., Manchester, N. H.
V Power Equipment Co., 50 Amperex St., Detroit 2, Mich.
V Rectifier Engineering Co., 1803 E. Seventh St., Los Angeles 21, Calif.
Richardson Allen Corp., 15 W. 20th St., New York 11, N. Y.
V Thor Electric & Machine Works, 15 S. Jefferson St., Chicago, Ill.
V Transmitter Equipment Co., Inc., 245 Hudson St., New York 14, N. Y.
Wattmon Co., 19400 West 8 Mile Rd., Detroit 19, Mich.
V WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
V Z & W Machine Products, Inc., Electronics Div., 4151 St. Clair Ave., Cleveland 3, Ohio.

REGULATORS—*Current*

V Tark Controller Co., 1146 E. 152nd St., Cleveland 10, Ohio.
V Electro Regulator Corp., 1938 Park Ave., New York 35, N. Y.
V ELECTRONIC MEASUREMENTS CO., Red Bank, N. J. ADV. PG. 139.
V First Electronics, 104 S. Jefferson St., Chicago 6, Ill.
V GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
V HIGHLAND ENGINEERING CO., 50 Holman Blvd., Hicksville, N. Y. ADV. PG. 194.
V Magnetic Instrument Co., 82 W. Main St., West Orange, N. J.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
V SORENSEN & CO., INC., 375 Fairfield Ave., Stamford, Conn. ADV. PG. 141.
V Vary Mfg. Co., Box 636, Garland, Texas.
V Vickers Electric Division, Vickers, Inc., 1815 Locust St., St. Louis 3, Mo.
V WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

REGULATORS—*Frequency*

V BRUSH DEVELOPMENT CO., 3405 Perkins Ave., Cleveland 14, Ohio. ADV. PG. 224, 225.
V Burlington Instrument Co., Burlington, Iowa.
V C. G. S. LABORATORIES, INC., 35 Ludlow St., Stamford, Conn. ADV. PG. 244.
V Electric Regulator Corp., 1938 Park Ave., New York 35, N. Y.
V Gaertner Labs., Inc., 2 East End Ave., New York 21, N. Y.
V GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
V Kellogg Switchboard & Supply Co., 6650 S. Cicero Ave., Chicago 38, Ill.
V Magnetic Instrument Co., 82 W. Main St., West Orange, N. J.
V Meter Electronics Inc., 5320 N. Kedzie Ave., Chicago 25, Ill.
V REEVES HOFFMAN CORP., 321 Cherry St., Carlisle, Pa. ADV. PG. 63.
V Robinette, Co., W. F., 803 Fair Oaks Ave., S. Pasadena, Calif.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Sierra Electronic Corp., San Carlos, Calif.
V Stanley Hoffman Corp., 1016 N. Highland Ave., Hollywood 38, Calif.
V Vickers Electric Division, Vickers, Inc., 1815 Locust St., St. Louis 3, Mo.

REGULATORS—*Voltage Regulators and Stabilizers*

V American Transformer Co., 245 Emmett St., Newark, N. J.
V ECLIPSE-PIONEER Div., Bendix Aviation Corp., Teterboro, N. J. ADV. PG. 176.
V Electric Autolite Co., The, Toledo 1, Ohio.
V Electric Regulator Corp., 1938 Park Ave., New York 35, N. Y.
V Electro Engineering Works, 6521 College Ave., Oakland 18, Calif.
V Electronic Engineering Corp., 624 Ridge Rd., Lyndhurst, N. J.
V ELECTRONIC MEASUREMENTS CO., Red Bank, N. J. ADV. PG. 139.
V Electronic Products Co., 111 E. 3rd St., Mt. Vernon, N. Y.
V FEDERAL TELEPHONE & RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.
V FERRANTI ELECTRIC, INC., 30 Rockefeller Plaza, New York 20, N. Y. ADV. PG. 81.
V First Electronics, 104 S. Jefferson St., Chicago 6, Ill.
V Gaertner Labs., Inc., 2 East End Ave., New York 21, N. Y.
V GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
V GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
V HIGHLAND ENGINEERING CO., 50 Holman Blvd., Hicksville, N. Y. ADV. PG. 194.
V LAMBDA ELECTRONICS CORP., 103-02 Northern Blvd., Corona, N. Y. ADV. PG. 268.
V Magnetic Instrument Co., 82 W. Main St., West Orange, N. J.
V RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
V RED BANK DIVISION, Bendix Aviation Corp., Red Bank, N. J. ADV. PG. 125.
Richardson Allen Corp., 15 W. 20th St., New York 11, N. Y.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
V Thor Electric Co., 4433 W. 16th St., Chicago 50, Ill.
V SORENSEN & CO., INC., 375 Fairfield Ave., Stamford, Conn. ADV. PG. 141.
V Standard Electrical Products Co., 402 E. 1st St., Dayton, Ohio.
V STANDARD TRANSFORMER CORP., Elston, Keeler & Addison, Chicago 18, Ill. ADV. PG. 62.
Stator Co., 99 New Park Ave., Hartford 6, Conn.
V SUPERIOR ELECTRIC CO., THE, 83 Meadow St., Bristol, Conn. ADV. PG. 115, 121.
V Thordarson Electric Mfg. Div., Maguire Industries, Inc., 500 W. Huron St., Chicago 10, Ill.
V UNITED TRANSFORMER CO., 150 Varick St., New York 13, N. Y. ADV. PG. Inside Front Cover.
V Vary Mfg. Co., Inc., Box 636, Garland, Texas.
V Vickers Electric Division, Vickers, Inc., 1815 Locust St., St. Louis 3, Mo.
Wattmon Co., 19400 West 8 Mile Rd., Detroit 19, Mich.
V WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

NOTE:
Throughout all relay listings:
(h) indicates hermetically sealed types

RELAYS—*Aircraft Type*

V Advance Electric & Relay Co., 2435 Naomi St., Burbank, Calif. (h)
V AIRCRAFT RADIO CORP., Boonton, N. J. ADV. PG. 148, 199.
V ALLIED CONTROL CO., INC., 2 East End Ave., New York 21, N. Y. ADV. PG. 98, 99. (h)
V American Relay & Controls, Inc., 4901 W. Flournoy St., Chicago 44, Ill. (h)
V Automatic Electric Sales Corp., 1033 W. Van Buren St., Chicago 7, Ill. (h)
V Clare & Co., C. P., 4719 Sunnyside Ave., Chicago 30, Ill. (h)
V Control Engineering Corp., 863 Washington St., Canton, Mass. (h)
V Cook Electric Co., 2700 Southport Ave., Chicago, Ill. (h)
V Cutler-Hammer, Inc., 411 N. 12th St., Milwaukee 1, Wis. (h)
V ECLIPSE-PIONEER DIV., Bendix Aviation Corp., Teterboro, N. J. ADV. PG. 176. (h)
V GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18. (h)
V GUARDIAN ELECTRIC MFG. CO., 1621 W. Walnut St., Chicago 12, Ill. ADV. PG. 31. (h)
V Leach Relay Co., The, 5915 Avalon Blvd., Los Angeles 3, Calif. (h)
V McQuay-Norris Mfg. Co., 2320 Marconi Ave., St. Louis 10, Mo. (h)
V PHILLIPS CONTROL CORP., 84 W. Jefferson St., Joliet, Ill. ADV. PG. 230. (h)
V POTTER & BRUMFIELD, Princeton, Indiana. ADV. PG. 58. (h)
V Price Electric Corp., Frederick, Md. (h)
V SIGMA INSTRUMENTS, INC., 62 Gayen St., Boston 22, Mass. ADV. PG. 197. (h)
V Signal Engineering & Mfg. Co., 154-6 W. 14th St., New York, N. Y. (h)
V Standard Electrical Products Co., 402 E. 1st St., Dayton, Ohio. (h)
V Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England. (h)
V Sterling Engineering Co., Lubbock, Tex. (h)
V Struthers-Dunn, Inc., 140 N. 13th Street, Philadelphia 7, Pa. (h)
V Vary Mfg. Co., Inc., Box 636, Garland, Texas. (h)
V WARD LEONARD ELECTRIC CO., 31 South St., Mt. Vernon, N. Y. ADV. PG. 53, 54. (h)

RELAYS—*Capacitance Operated*

V Advance Electric & Relay Co., 2435 Naomi St., Burbank, Calif. (h)
V Fielden Electronics Inc., 1171 New York Ave., Huntington Station, N. Y.
V Niagara Electron Laboratories, Andover, N. Y.
V Photobell Company, 116 Nassau St., New York 7, N. Y.
V Signal Engineering & Mfg. Co., 154-6 W. 14th St., New York, N. Y.

RELAYS—*Coaxial*

V Advance Electric & Relay Co., 2435 Naomi St., Burbank, Calif. (h)
V ALLIED CONTROL CO., INC., 2 East End Ave., New York 21, N. Y. ADV. PG. 98, 99. (h)
V GUARDIAN ELECTRIC MFG. CO., 1621 W. Walnut St., Chicago 12, Ill. ADV. PG. 31. (h)
V Press Wireless Mfg. Co., Inc., Cantiague Rd., Hicksville, L. I., N. Y.
V Price Electric Corp., Frederick, Md. (h)
V Product Development Co., Inc., Arlington, N. J.
V Signal Engineering & Mfg. Co., 154-6 W. 14th St., New York, N. Y.

RELAYS—*d'Arsonval*

V Assembly Products, Inc., Chagrin Falls 6, Ohio.
V Cook Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
V EDISON INC., THOMAS A., Instrument Div., West Orange, N. J. ADV. PG. 129. (h)
V Electric Design & Mfg. Corp., Burlington, Iowa. (h)
V Simpson Electric Co., Div. of American Gage & Machine Co., 5200 W. Kinzie St., Chicago 44, Ill. (h)
V Triplett Electrical Instrument Co., 286 Harmon Road, Bluffton, Ohio. (h)
V WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77. (h)
V WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108. (h)

RELAYS—*Differential*

V AIRPAX PRODUCTS CO., 1024 Greenmount Ave., Baltimore 2, Md. ADV. PG. 235. (h)
V ALLIED CONTROL CO., INC., 2 East End Ave., New York 21, N. Y. ADV. PG. 98, 99. (h)
V American Relay & Controls, Inc., 4901 W. Flournoy St., Chicago 44, Ill. (h)

Ⓥ Automatic Electric Sales Corp., 1033 W. Van Buren St., Chicago 7, Ill. (h)
Ⓥ Clare & Co., C. P., 4719 Sunnyside Ave., Chicago 30, Ill. (h)
Ⓥ Cook Electric Co., 2700 Southport Ave., Chicago, Ill. (h)
Ⓥ EDISON INC., THOMAS A., Instrument Div., West Orange, N. J. ADV. PG. 129 (h)
Ⓥ Electric Regulator Corp., 1938 Park Ave., New York 35, N. Y. (h)
Ⓥ KURMAN ELECTRIC CO., INC., 35-18 37th St., Long Island City 1, N. Y. ADV. PG. 214 (h)
Ⓥ McQuay-Norris Mfg. Co., 2320 Marconi Ave., St. Louis 10, Mo. (h)
Ⓥ PHILLIPS CONTROL CORP., 84 W. Jefferson St., Joliet, Ill. ADV. PG. 230 (h)
Ⓥ Price Electric Corp., Frederick, Md. (h)
Ⓥ SIGMA INSTRUMENTS, INC., 80 Ceylon St., Boston 22, Mass. ADV. PG. 195 (h)
Ⓥ Signal Engineering & Mfg. Co., 154-6 W. 14th St., New York, N. Y. (h)
Ⓥ Standard Electrical Products Co., 402 E. 1st St., Dayton, Ohio. (h)
Ⓥ Sterling Engineering Co., Laconia, N. H. (h)
Ⓥ WARD LEONARD ELECTRIC CO., 31 South St., Mt. Vernon, N. Y. ADV. PG. 51, 52 (h)
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77

RELAYS—*Electronic Current*

Ⓥ Advance Electric & Relay Co., 2435 Naomi St., Burbank, Calif. (h)
Ⓥ ALLIED CONTROL CO., INC., 2 East End Ave., New York 21, N. Y. ADV. PG. 98, 99 (h)
Ⓥ American Relay & Controls, Inc., 4901 W. Flournoy St., Chicago 44, Ill. (h)
Ⓥ Automatic Electric Sales Co., 1033 W. Van Buren St., Chicago 7, Ill. (h)
Ⓥ Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa. (h)
Ⓥ Central Scientific Co., 1700 Irving Park Rd., Chicago 13, Ill. (h)
Ⓥ Clare & Co., C. P., 4719 Sunnyside Ave., Chicago 30, Ill. (h)
Ⓥ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif. (h)
Ⓥ Corona Engineering Service, 94-52 Corona Ave., Elmhurst, N. Y. (h)
Ⓥ Deltz Co., S. J., Box 65, W. Englewood, N. J. (h)
Ⓥ Electronic Control Corp., 1573 E. Forest St., Detroit, Mich. (h)
Ⓥ Fischer Scientific Co., 717 Forbes St., Pittsburgh 19, Pa. (h)
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18. (h)
Ⓥ Gorrell & Gorrell, Haworth, N. J. (h)
Ⓥ Industrial Electronics Co., Inc., Hanover, Mass. (h)
Ⓥ KURMAN ELECTRIC CO., INC., 35-18 37th St., Long Island City 1, N. Y. ADV. PG. 214 (h)
Ⓥ Leach Relay Co., 5915 Avalon Blvd., Los Angeles 3, Calif. (h)
Mack Electrical Devices Inc., 43 Glenside Ave., Wyncote, Pa. (h)
Ⓥ Manning, Maxwell & Moore, Inc., Stratford, Conn. (h)
Ⓥ PHILLIPS CONTROL CORP., 84 W. Jefferson St., Joliet, Ill. ADV. PG. 230 (h)
Ⓥ POTTER & BRUMFIELD, Princeton, Indiana. ADV. PG. 58 (h)
Ⓥ Price Electric Corp., Frederick, Md. (h)
Ⓥ R. B. M. Division, Essex Wire Corp., Logansport, Ind. (h)
Ⓥ SERVO-TEK PRODUCTS CO., 4 Godwin Ave., Paterson 1, N. J. ADV. PG. 197 (h)
Ⓥ SIGMA INSTRUMENTS, INC., 80 Ceylon St., Boston 22, Mass. ADV. PG. 195 (h)
Ⓥ Signal Engineering & Mfg. Co., 154-6 W. 14th Street, New York, N. Y. (h)
Ⓥ Standard Electrical Products Co., 402 E. 1st St., Dayton, Ohio. (h)
Ⓥ Sterling Engineering Co., Laconia, N. H. (h)
Ⓥ Varo Mfg. Co., Box 638, Garland, Texas. (h)
Ⓥ WARD LEONARD ELECTRIC CO., 31 South St., Mt. Vernon, N. Y. ADV. PG. 51, 52 (h)
Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

RELAYS—*Frequency Selective*

Ⓥ Advance Electric & Relay Co., 2435 Naomi St., Burbank, Calif. (h)
Ⓥ ALLIED CONTROL CO., INC., 2 East End Ave., New York 21, N. Y. ADV. PG. 98, 99 (h)
Ⓥ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif. (h)
Ⓥ Control Corp., 718 Central Ave., Minneapolis 14, Minn. (h)
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18. (h)
Ⓥ Kellogg Switchboard & Supply Co., 6650 S. Cicero Ave., Chicago 38, Ill. (h)
Ⓥ Leach Relay Co., 5915 Avalon Blvd., Los Angeles 3, Calif. (h)
Ⓥ Signal Engineering & Mfg. Co., 154-6 W. 14th St., New York, N. Y. (h)
Ⓥ Stevens-Arnold, Inc., 22 Elkins St., South Boston 27, Mass. (h)
Ⓥ Varo Mfg. Co., Inc., Box 638, Garland, Texas. (h)
Ⓥ Wallace & Tiernan Products, Inc., Belleville 9, N. J. (h)
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77
Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

RELAYS—*General Purpose*

Ⓥ Adams & Westlake Co., Michigan St., Elkhart, Ind. (h)
Ⓥ Advance Electric & Relay Co., 2435 Naomi St., Burbank, Calif. (h)
Ⓥ Allen-Bradley Co., 136 W. Greenfield Ave., Milwaukee 4, Wis. (h)
Ⓥ ALLIED CONTROL CO., INC., 2 East End Ave., New York 21, N. Y. ADV. PG. 98, 99. (h)
Ⓥ American Relay & Controls, Inc., 4901 W. Flournoy St., Chicago 44, Ill. (h)
Ⓥ Autocall Co., The, Shelby, Ohio.
Ⓥ Automatic Electric Sales Corp., 1033 W. Van Buren St., Chicago 7, Ill. (h)
Ⓥ Automatic Switch Co., 391 Lakeside Ave., Orange, N. J. (h)
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ Clare & Co., C. P., 4719 Sunnyside Ave., Chicago 30, Ill. (h)
Ⓥ Cook Electric Co., 2700 Southport Ave., Chicago, Ill.
Ⓥ Cutler-Hammer, Inc., 411 N. 12th St., Milwaukee 1, Wis.
Durakool Inc., 1010 N. Main St., Elkhart, Ind.
Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
Ⓥ GRAYHILL, 4524 W. Madison St., Chicago 24, Ill. ADV. PG. 240 (h)
Ⓥ GUARDIAN ELECTRIC MFG. CO., 1621 W. Walnut St., Chicago 12, Ill. ADV. PG. 31 (h)
Ⓥ KURMAN ELECTRIC CO., INC., 35-18 37th St., Long Island City 1, N. Y. ADV. PG. 214 (h)
Ⓥ Leach Relay Co., 5915 Avalon Blvd., Los Angeles 3, Calif. (h)
Ⓥ Minneapolis-Honeywell Regulator Co., 2753 Fourth Ave. S., Minneapolis, Minn. (h)
Ⓥ PHILLIPS CONTROL CORP., 84 W. Jefferson St., Joliet, Ill. ADV. PG. 230 (h)
Ⓥ POTTER & BRUMFIELD, Princeton, Indiana. ADV. PG. 58 (h)
Ⓥ Price Electric Corp., Frederick, Md. (h)
Ⓥ R. B. M. Div., Essex Wire Corp., Logansport, Ind. (h)
Ⓥ SIGMA INSTRUMENTS, INC., 80 Ceylon St., Boston 22, Mass. ADV. PG. 195. (h)
Ⓥ Signal Engineering & Mfg. Co., 154-6 W. 14th St., New York, N. Y. (h)
Ⓥ Standard Electrical Products Co., 402 E. 1st St., Dayton, Ohio. (h)
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ Sterling Engineering Co., Laconia, N. H. (h)
Ⓥ Struthers-Dunn, Inc., 150 N. 13th St., Philadelphia 7, Pa. (h)
Ⓥ WARD LEONARD ELECTRIC CO., 31 South Street, Mt. Vernon, N. Y. ADV. PG. 51, 52. (h)
Ⓥ Warrick Co., Chas. F., 16251 Hamilton Ave., Detroit 3, Mich. (h)
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77
Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

RELAYS—*Impulse*

Ⓥ Advance Electric & Relay Co., 2435 Naomi St., Burbank, Calif. (h)
Ⓥ ALLIED CONTROL CO., INC., 2 East End Ave., New York 21, N. Y. ADV. PG. 98, 99. (h)
Ⓥ Autocall Co., The, Shelby, Ohio.
Ⓥ Automatic Electric Sales Corp., 1033 W. Van Buren St., Chicago 7, Ill. (h)
Ⓥ Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.
Ⓥ Clare & Co., C. P., 4719 Sunnyside Ave., Chicago 30, Ill. (h)
Ⓥ Gates Radio Co., Quincy, Ill.
Ⓥ Kellogg Switchboard & Supply Co., 6650 S. Cicero Ave., Chicago 38, Ill.
Ⓥ Leach Relay Co., 5915 Avalon Blvd., Los Angeles 3, Calif. (h)
Ⓥ PHILLIPS CONTROL CORP., 84 W. Jefferson St., Joliet, Ill. ADV. PG. 230. (h)
Ⓥ Price Electric Corp., Frederick, Md. (h)
Ⓥ SIGMA INSTRUMENTS, INC., 80 Ceylon St., Boston 22, Mass. ADV. PG. 195. (h)
Ⓥ Signal Engineering & Mfg. Co., 154-6 W. 14th St., New York, N. Y. (h)
Ⓥ Sterling Engineering Co., Laconia, N. H. (h)
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Zenith Electric Co., 152 W. Walton St., Chicago 10, Ill.

RELAYS—*Industrial Control*

Ⓥ Adams & Westlake Co., Michigan St., Elkhart, Ind. (h)
Ⓥ Advance Electric & Relay Co., 2435 Naomi St., Burbank, Calif. (h)
Ⓥ Allen-Bradley Co., 136 W. Greenfield Ave., Milwaukee 4, Wisconsin. (h)
Ⓥ ALLIED CONTROL CO., INC., 2 East End Ave., New York 21, N. Y. ADV. PG. 98, 99. (h)
Ⓥ American Relay & Control, Inc., 4901 W. Flournoy St., Chicago 44, Ill. (h)
Ⓥ Automatic Electric Sales Corp., 1033 W. Van Buren St., Chicago 7, Ill. (h)
Ⓥ Automatic Signal Division, 100 Regent St., East Norwalk, Conn.
Ⓥ Automatic Switch Co., 391 Lakeside Ave., Orange, N. J.
Ⓥ Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.
Ⓥ Clare & Co., C. P., 4719 Sunnyside Ave., Chicago 30, Ill. (h)
Ⓥ Clark Controller Co., 1146 E. 152nd St., Cleveland 10, Ohio.
Ⓥ Cook Electric Co., 2700 Southport Ave., Chicago 14, Ill.
Ⓥ Corona Engineering Service, 94-52 Corona Ave., Elmhurst, N. Y.
Ⓥ Cutler-Hammer, Inc., 411 No. 12th St., Milwaukee 1, Wis.
Ⓥ Deltz Co., S. J., Box 65, W. Englewood, N. J.
Durakool, Inc., 1010 N. Main St., Elkhart, Ind.
Ⓥ General Control Co., Glendale 1, Calif.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18. (h)
Ⓥ Gorrell & Gorrell, Haworth, N. J.
Ⓥ GUARDIAN ELECTRIC MFG. CO., 1621 W. Walnut St., Chicago 12, Ill. ADV. PG. 31. (h)
INDUSTRIAL ELECTRONICS, INC., 2457 Woodward Ave., Detroit 1, Mich. ADV. PG. 255.
Ⓥ KURMAN ELECTRIC CO., INC., 35-18 37th St., Long Island City 1, N. Y. ADV. PG. 214.
Ⓥ Leach Relay Co., 5915 Avalon Blvd., Los Angeles 3, Calif. (h)
Mack Electrical Devices Inc., 43 Glenside Ave., Wyncote, Pa. (h)
Ⓥ Minneapolis-Honeywell Regulator Co., 2753 Fourth Avenue S., Minneapolis, Minn.
Ⓥ PHILLIPS CONTROL CORP., 84 W. Jefferson St., Joliet, Ill. ADV. PG. 230. (h)
Ⓥ POTTER & BRUMFIELD, Princeton, Indiana. ADV. PG. 58. (h)
Ⓥ Roller-Smith, Bethlehem, Pa.
Ⓥ SIGMA INSTRUMENTS, INC., 80 Ceylon St., Boston 22, Mass. ADV. PG. 195. (h)
Ⓥ Signal Engineering & Mfg. Co., 154-6 W. 14th St., New York, N. Y.
Ⓥ Simpson Electric Co., Div. of American Gage & Machine Co., 5208 W. Kinzie St., Chicago 44, Ill.
Ⓥ Triplett Electrical Instrument Co., 236 Harmon Rd., Bluffton, Ohio.
Ⓥ WARD LEONARD ELECTRIC CO., 31 South St., Mt. Vernon, N. Y. ADV. PG. 51, 52. (h)

RELAYS—*Keying and Break-In*

Ⓥ Advance Electric & Relay Co., 2435 Naomi St., Burbank, Calif. (h)
Ⓥ ALLIED CONTROL CO., INC., 2 East End Ave., New York 21, N. Y. ADV. PG. 98, 99. (h)

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

Ⓥ Automatic Electric Sales Corp., 1033 W. Van Buren St., Chicago 7, Ill. (h)
Ⓥ Bantam Inc., H. O., 915 Broadway, New York 10, N. Y. (h)
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y. (h)
Ⓥ Clare & Co., C. P., 4719 Sunnyside Ave., Chicago 30, Ill. (h)
Ⓥ GUARDIAN ELECTRIC MFG. CO., 1621 W. Walnut St., Chicago 12, Ill. ADV. PG. 81. (h)
Ⓥ KURMAN ELECTRIC CO., INC., 35-18 37th St., Long Island City 1, N. Y. ADV. PG. 214. (h)
Ⓥ Leach Relay Co., Inc., 5915 Avalon Blvd., Los Angeles 3, Calif. (h)
Ⓥ POTTER & BRUMFIELD, Princeton, Indiana. ADV. PG. 58. (h)
Ⓥ SIGMA INSTRUMENTS, INC., 80 Ceylon St., Boston 22, Mass. ADV. PG. 195. (h)
Ⓥ Signal Engineering & Mfg. Co., 154-6 W. 14th St., New York, N. Y.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England
Ⓥ Stevens-Arnold, Inc., 22 Elkins St., South Boston 27, Mass. (h)
Ⓥ WARD LEONARD ELECTRIC CO., 31 South St., Mt. Vernon, N. Y. ADV. PG. 52, 52. (h)

RELAYS—*Latching*

Ⓥ Advance Electric & Relay Co., 2435 Naomi St., Burbank, Calif. (h)
Ⓥ ALLIED CONTROL CO., INC., 2 East End Ave., New York 21, N. Y. ADV. PG. 98, 99. (h)
Ⓥ Autocall Co., The, Shelby, Ohio
Ⓥ Automatic Electric Sales Corp., 1033 W. Van Buren St., Chicago 7, Ill. (h)
Ⓥ Automatic Switch Co., 391 Lakeside Ave., Orange, N. J.
Ⓥ Clare & Co., C. P., 4719 Sunnyside Ave., Chicago 30, Ill. (h)
Ⓥ Cook Controller Co., 1146 E. 152nd St., Cleveland 10, Ohio
Ⓥ Control Corp., 718 Central Ave., Minneapolis 14, Minn.
Ⓥ Cook Electric Co., 2700 Southport Ave., Chicago 14, Ill. (h)
Ⓥ Elgin Metal Co., Quincy, Ill.
Ⓥ GUARDIAN ELECTRIC MFG. CO., 1621 W. Walnut St., Chicago 12, Ill. ADV. PG. 81. (h)
Ⓥ Hoffman Engineering Corp., Anoka, Minn.
Ⓥ KURMAN ELECTRIC CO., INC., 35-18 37th St., Long Island City 1, N. Y. ADV. PG. 214.
Ⓥ Leach Relay Co., Inc., 5915 Avalon Blvd., Los Angeles 3, Calif. (h)
Ⓥ LELAND INC., G. H., 123 Webster St., Dayton 2, Ohio. ADV. 246, 247.
Ⓥ North Electric Mfg. Co., 501 S. Market St., Galion, Ohio.
Ⓥ PHILLIPS CONTROL CORP., 84 W. Jefferson St., Joliet, Ill. ADV. PG. 230. (h)
Ⓥ POTTER & BRUMFIELD, Princeton, Indiana. ADV. PG. 58. (h)
Ⓥ Price Electric Corp., Frederick, Md. (h)
Ⓥ R. B. M. Division, Essex Wire Corporation, Logansport, Ind.
Ⓥ SIGMA INSTRUMENTS, INC., 80 Ceylon St., Boston 22, Mass. ADV. PG. 195. (h)
Ⓥ Signal Engineering & Mfg. Co., 154-6 W. 14th St., New York, N. Y.
Ⓥ Standard Electrical Products Co., 402 E. 1st St., Dayton, Ohio.
Ⓥ Struthers-Dunn, Inc., 150 N. 13th St., Philadelphia 7, Pa. (h)
Ⓥ WARD LEONARD ELECTRIC CO., 31 South St., Mt. Vernon, N. Y. ADV. PG. 51, 52. (h)

RELAYS—*Mercury*

Ⓥ Adams & Westlake Co., Michigan St., Elkhart, Ind.
Ⓥ American Relay & Controls, Inc., 4901 W. Flournoy St., Chicago 44, Ill. (h)
Ⓥ Automatic Electric Sales Corp., 1033 W. Van Buren St., Chicago 7, Ill. (h)
Ⓥ Clare & Co., C. P., 4719 Sunnyside Ave., Chicago 30, Ill. (h)
Ⓥ Durakool, Inc., 1010 N. Main St., Elkhart, Ind.
Ⓥ Ohmart Electronics Corp., 185-09 Jamaica Ave., Hollis 5, N. Y. (h)
Mack Electrical Devices, Inc., 43 Glenside Ave., Wyncote, Pa.
Ⓥ POTTER & BRUMFIELD, Princeton, Indiana. ADV. PG. 58. (h)
Ⓥ Standard Electrical Products Co., 402 E. 1st St., Dayton, Ohio.
Ⓥ Struthers-Dunn, Inc., 150 N. 13th St., Philadelphia 7, Pa. (h)

RELAYS—*Multipole*

Ⓥ Advance Electric & Relay Co., 2435 Naomi St., Burbank, Calif. (h)
Ⓥ ALLIED CONTROL CO., INC., 2 East End Ave., New York 21, N. Y. ADV. PG. 98, 99. (h)
Ⓥ American Relay & Controls, Inc., 4901 W. Flournoy St., Chicago 44, Ill. (h)
Ⓥ Autocall Co., The, Shelby, Ohio.
Ⓥ Automatic Electric Sales Corp., 1033 W. Van Buren St., Chicago 7, Ill. (h)
Ⓥ Automatic Switch Co., 391 Lakeside Ave., Orange, N. J.
Ⓥ Clare & Co., C. P., 4719 Sunnyside Ave., Chicago 30, Ill. (h)
Ⓥ Cook Electric Co., 2700 Southport Ave., Chicago 14, Ill. (h)
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18. (h)
Ⓥ Leach Relay Co., 5915 Avalon Blvd., Los Angeles 3, Calif. (h)
Ⓥ LELAND INC., G. H., 123 Webster Ave., Dayton 2, Ohio. ADV. PG. 246, 247.
Ⓥ Minneapolis Honeywell Regulator Co., 2753 Fourth Avenue, S., Minneapolis, Minn.
Ⓥ PHILLIPS CONTROL CORP., 84 W. Jefferson St., Joliet, Ill. ADV. PG. 230. (h)
Ⓥ POTTER & BRUMFIELD, Princeton, Indiana. ADV. PG. 58. (h)
Ⓥ Price Electric Corp., Frederick, Md. (h)
Ⓥ R. B. M. Div., Essex Wire Corp., Logansport, Ind. (h)
Ⓥ SIGMA INSTRUMENTS, INC., 80 Ceylon St., Boston 22, Mass. ADV. PG. 195. (h)
Ⓥ Signal Engineering & Mfg. Co., 154-6 W. 14th St., New York, N. Y.
Ⓥ Standard Electrical Products Co., 402 E. 1st St., Dayton, Ohio.
Ⓥ Struthers-Dunn, Inc., 150 N. 13th St., Philadelphia 7, Pa. (h)
Ⓥ WARD LEONARD ELECTRIC CO., 31 South St., Mt. Vernon, N. Y. ADV. PG. 51, 52. (h)
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

RELAYS—*Overload and Underload*

Ⓥ Adams & Westlake Co., Michigan St., Elkhart, Ind. (h)
Ⓥ Advance Electric & Relay Co., 2435 Naomi St., Burbank, Calif. (h)
Ⓥ ALLIED CONTROL CO., INC., 2 East End Ave., New York 21, N. Y. ADV. PG. 98, 99. (h)
Ⓥ American Relay & Controls, Inc., 4901 W. Flournoy St., Chicago 44, Ill. (h)
Ⓥ Automatic Electric Sales Corp., 1033 W. Van Buren St., Chicago 7, Ill. (h)
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ Clare & Co., C. P., 4719 Sunnyside Ave., Chicago 30, Ill. (h)
Ⓥ Clark Controller Co., 1146 E. 152nd St., Cleveland 10, Ohio
Ⓥ Cook Electric Co., 2700 Southport Ave., Chicago 14, Ill. (h)
Ⓥ Cutler-Hammer, Inc., 411 N. 12th St., Milwaukee 1, Wis.
Ⓥ EDISON, INC., THOMAS A., Instrument Div., West Orange, N. J. ADV. PG. 129.
Ⓥ Federal Electric Products Co., 50 Paris St., Newark, N. J.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18. (h)
Ⓥ GUARDIAN ELECTRIC MFG. CO., 1621 W. Walnut St., Chicago 12, Ill. ADV. PG. 81. (h)
Ⓥ Industrial Electronics Co., Inc., Hanover, Mass.
Ⓥ JENNINGS RADIO MFG. CO., 1098 E. William St., San Jose 12, Calif. ADV. PG. 114, 115.
Ⓥ KURMAN ELECTRIC CO., INC., 35-18 37th St., Long Island City 1, N. Y. ADV. PG. 214.
Ⓥ Leach Relay Co., 5915 Avalon Blvd., Los Angeles 3, Calif. (h)
Mack Electrical Devices, Inc., 43 Glenside Ave., Wyncote, Pa. (h)
Ⓥ Price Electric Corp., Frederick, Md. (h)
Ⓥ R. B. M. Division, Essex Wire Corp., Logansport, Ind. (h)
Ⓥ Roller-Smith, Bethlehem, Pa.
Ⓥ SIGMA INSTRUMENTS, INC., 80 Ceylon St., Boston 22, Mass. ADV. PG. 195. (h)
Ⓥ Signal Engineering & Mfg. Co., 154-6 W. 14th St., New York, N. Y.
Ⓥ Standard Electrical Products Co., 402 E. 1st St., Dayton, Ohio.
Ⓥ Struthers-Dunn, Inc., 150 N. 13th St., Philadelphia 7, Pa. (h)
Ⓥ WARD LEONARD ELECTRIC CO., 31 South St., Mt. Vernon, N. Y. ADV. PG. 51, 52. (h)
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

RELAYS—*Photoelectric*

Ⓥ Advance Electric & Relay Co., 2435 Naomi St., Burbank, Calif. (h)
Ⓥ Arnerican, Inc., P. O. Box 151, Caldwell, N. J.
Ⓥ ALLIED CONTROL CO., INC., 2 East End Ave., New York 21, N. Y. ADV. PG. 98, 99. (h)
Ⓥ American Scientific Co., P. O. Box 1, Highbridge Station, New York 52, N. Y.
Ⓥ Automatic Electric Sales Corp., 1033 W. Van Buren St., Chicago 7, Ill. (h)
Ⓥ Bentz Co., S. J., Box 65, W. Englewood, N. J.
Ⓥ Electronic Control Corp., 1523 E. Forest St., Detroit, Mich.
Ⓥ Esi Instrument Co., 96 So. Washington Ave., Bergenfield, N. J.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18. (h)
Ⓥ Gurnell & Gurnell, Haworth, N. J.
Ⓥ Industrial Electronics Co., Inc., Hanover, Mass.
INDUSTRIAL ELECTRONICS, INC., 2457 Woodward Ave., Detroit 1, Mich. ADV. PG. 260.
Ⓥ KURMAN ELECTRIC CO., INC., 35-18 37th St., Long Island City 1, N. Y. ADV. PG. 214.
Ⓥ Electro-Max Inc., 15 S. First St., Geneva, Ill.
Lumenite Electric Co., 407 So. Dearborn St., Chicago 5, Ill.
Ⓥ O'Connor & Co., John T., West Orange, N. J.
Ⓥ PHILLIPS CONTROL CORP., 84 W. Jefferson St., Joliet, Ill. ADV. PG. 230. (h)
Ⓥ Photobell Company, 116 Nassau St., New York 7, N. Y.
Ⓥ POTTER & BRUMFIELD, Princeton, Indiana. ADV. PG. 58. (h)
Ⓥ POTTER INSTRUMENT CO., INC., 115 Cutter Mill Rd., Great Neck, N. Y. ADV. PG. 204.
Ⓥ Price Electric Corp., Frederick, Md. (h)
Ripley Co., Inc., P. O. Box 31, Middletown, Conn.
Ⓥ Signal Engineering & Mfg. Co., 154-6 W. 14th St., New York, N. Y.
Ⓥ Special Products Co., 9115 Brookville Rd., P. O. Box 471, Silver Spring, Md.
Ⓥ Sterling Engineering Co., Laconia, N. H. (h)
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.
Ⓥ Worner Electronic Devices, Rankin, Ill.

RELAYS—*Plate Circuit*

Ⓥ Adams & Westlake Co., Michigan St., Elkhart, Ind.
Ⓥ Advance Electric & Relay Co., 2435 Naomi St., Burbank, Calif. (h)
Ⓥ ALLIED CONTROL CO., INC., 2 East End Ave., New York 21, N. Y. ADV. PG. 98, 99. (h)
Ⓥ American Relay & Controls, Inc., 4901 W. Flournoy St., Chicago 44, Ill. (h)
Ⓥ Automatic Electric Sales Corp., 1033 W. Van Buren St., Chicago 7, Ill. (h)
Ⓥ Clare & Co., C. P., 4719 Sunnyside Ave., Chicago 30, Ill. (h)
Ⓥ Control Corp., 718 Central Ave., Minneapolis 14, Minn.
Ⓥ Control Engineering Corp., 863 Washington St., Canton, Mass. (h)
Ⓥ KURMAN ELECTRIC CO., INC., 35-18 37th St., Long Island City 1, N. Y. ADV. PG. 214.
Ⓥ Leach Relay Co., 5915 Avalon Blvd., Los Angeles 3, Calif. (h)
Ⓥ PHILLIPS CONTROL CORP., 82 W. Jefferson St., Joliet, Ill. ADV. PG. 230. (h)
Ⓥ POTTER & BRUMFIELD, Princeton, Ind. ADV. PG. 58. (h)
Ⓥ Price Electric Corp., Frederick, Md. (h)
Ⓥ R. B. M. Div., Essex Wire Corp., Logansport, Ind. (h)
Ⓥ SIGMA INSTRUMENTS, INC., 80 Ceylon St., Boston 22, Mass. ADV. PG. 195. (h)
Ⓥ Signal Engineering & Mfg. Co., 154-6 W. 14th St., New York, N. Y.
Ⓥ Spencer Thermostat Co., 34 Forest St., Attleboro, Mass.
Ⓥ Standard Electrical Products Co., 402 E. 1st St., Dayton, Ohio.
Ⓥ Sterling Engineering Co., Laconia, N. H. (h)
Ⓥ WARD LEONARD ELECTRIC CO., 31 South St., Mt. Vernon, N. Y. ADV. PG. 51, 52. (h)
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

RELAYS—*Polarized*

Ⓥ AIRPAX PRODUCTS CO., 1024 Greenmount Ave., Baltimore 2, Md. ADV. PG. 275.
Ⓥ ALLIED CONTROL CO., INC., 2 East End Ave., New York 21, N. Y. ADV. PG. 98, 99. (h)
Ⓥ Automatic Electric Sales Corp., 1033 W. Van Buren St., Chicago 7, Ill. (h)
Ⓥ Barber-Colman Co., Rockford, Ill. (h)
Ⓥ Clare & Co., C. P., 4719 Sunnyside Ave., Chicago 30, Ill. (h)
Ⓥ EDISON, INC., THOMAS A., Instrument Div., West Orange, N. J. ADV. PG. 129. (h)
Ⓥ KURMAN ELECTRIC CO., INC., 35-18 37th St., Long Island City 1, N. Y. ADV. PG. 214.
Ⓥ Magnetic Devices, Inc., 712 East St., Frederick, Md.
Ⓥ Price Electric Corp., Frederick, Md. (h)
Ⓥ SIGMA INSTRUMENTS, INC., 80 Ceylon St., Boston 22, Mass. ADV. PG. 195. (h)
Ⓥ Signal Engineering & Mfg. Co., 154-6 W. 14th St., New York, N. Y.
Ⓥ Stevens-Arnold, Inc., 22 Elkins St., South Boston 27, Mass. (h)
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

RELAYS—*Power*

Ⓥ Adams & Westlake Co., Michigan St., Elkhart, Ind.
Ⓥ Advance Electric & Relay Co., 2435 Naomi St., Burbank, Calif. (h)
Ⓥ Allen-Bradley Co., 136 W. Greenfield Ave., Milwaukee 4, Wis.
Ⓥ ALLIED CONTROL CO., INC., 2 East End Ave., New York 21, N. Y. ADV. PG. 98, 99. (h)
Ⓥ American Relay & Controls, Inc., 4901 W. Flournoy St., Chicago 44, Ill. (h)
Ⓥ Automatic Switch Co., 391 Lakeside Ave., Orange, N. J.
Ⓥ Clare & Co., C. P., 4719 Sunnyside Ave., Chicago 30, Ill. (h)
Ⓥ Cook Electric Co., 2700 Southport Ave., Chicago 14, Ill.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18. (h)

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

Ⓥ Gerson Specialties Co., 906 W. North Ave., Chicago 22, Ill.
Ⓥ JENNINGS RADIO MFG. CO., 1098 E. William St., San Jose 12, Calif. ADV. PG. 114, 115.
Ⓥ KURMAN ELECTRIC CO. INC., 35-18 37th St., Long Island City 1, N. Y. ADV. PG. 214.
Ⓥ Leach Relay Co., 5915 Avalon Blvd., Los Angeles 3, Calif. (h)
Mack Electrical Devices Inc., 43 Glenside Ave., Wyncote, Pa. (h)
Ⓥ Magnetic Devices Inc., 712 East St., Frederick, Md.
Ⓥ PHILLIPS CONTROL CORP., 84 W. Jefferson St., Joliet, Ill. ADV. PG. 230. (h)
Ⓥ POTTER & BRUMFIELD, Princeton, Indiana. ADV. PG. 58. (h)
Ⓥ Price Electric Corp., Frederick, Md. (h)
Ⓥ R. B. M. Division, Essex Wire Corp., Logansport, Ind.
Ⓥ Signal Engineering & Mfg. Co., 154-6 W. 14th St., New York, N. Y.
Ⓥ Standard Electrical Products Co., 402 E. 1st St., Dayton, Ohio. (h)
Ⓥ Struthers-Dunn, Inc., 150 N. 13th St., Philadelphia 7, Pa. (h)
Ⓥ WARD LEONARD ELECTRIC CO., 31 South St., Mt. Vernon, N. Y. ADV. PG. 51, 52. (h)
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

RELAYS—*Rotary*

Ⓥ ALLIED CONTROL CO., INC., 2 East End Ave., New York 21, N. Y. ADV. PG. 98, 99. (h)
Ⓥ Autocall Co., The, Shelby, Ohio.
Ⓥ Automatic Electric Sales Corp., 1033 W. Van Buren St., Chicago 7, Ill. (h)
Ⓥ Clare & Co., C. P., 4719 Sunnyside Ave., Chicago 30, Ill. (h)
Ⓥ LELAND, INC., G. H., 123 Webster St., Dayton 2, Ohio. ADV. PG. 246, 247.
Ⓥ Magnetic Devices, Inc., 712 East St., Frederick, Md.
Ⓥ Price Electric Corp., Frederick, Md. (h)
Ⓥ Signal Engineering & Mfg. Co., 154-6 W. 14th St., New York, N. Y.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ U. S. Instrument Corp., 409 Broad St., Summit, N. J.

RELAYS—*Sensitive Control*

Ⓥ Adams & Westlake Co., Michigan St., Elkhart, Ind.
Ⓥ Advance Electric & Relay Co., 2435 Naomi St., Burbank, Calif. (h)
Ⓥ ALLIED CONTROL CO., INC., 2 East End Ave., New York 21, N. Y. ADV. PG. 98, 99. (h)
Ⓥ American Relay & Controls, Inc., 4901 W. Flournoy St., Chicago 44, Ill. (h)
Ⓥ Assembly Products, Inc., Chagrin Falls 6, Ohio.
Ⓥ Automatic Electric Sales Corp., 1033 W. Van Buren St., Chicago 7, Ill. (h)
Ⓥ Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.
Ⓥ Biddle Co., James G., 1316 Arch St., Philadelphia 7, Pa.
Ⓥ Clare & Co., C. P., 4719 Sunnyside Ave., Chicago 30, Ill.
Ⓥ Control Engineering Corp., 869 Washington St., Canton, Mass. (h)
Ⓥ Deitz Co., S. J., Box 65, W. Englewood, N. J.
Ⓥ EDISON INC., THOMAS A., Instrument Div., West Orange, N. J. ADV. PG. 139. (h)
Ⓥ General Controls Co., Glendale 1, Calif.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18. (h)
Ⓥ Gerrett & Gorrell, Haworth, N. J.
Ⓥ KURMAN ELECTRIC CO., INC., 35-18 37th St., Long Island City 1, N. Y. ADV. PG. 214.
Ⓥ Leach Relay Co., 5915 Avalon Blvd., Los Angeles 3, Calif. (h)
Lumenite Electric Co., 407 S. Dearborn St., Chicago, Ill. (h)
Mack Electrical Devices Inc., 43 Glenside Ave., Wyncote, Pa. (h)
Ⓥ Magnetic Devices, Inc., 712 East St., Frederick, Md.
Ⓥ Minneapolis-Honeywell Regulator Co., 2753 Fourth Avenue, S., Minneapolis, Minn.
Ⓥ PHILLIPS CONTROL CORP., 84 W. Jefferson St., Joliet, Ill. ADV. PG. 230. (h)
Ⓥ POTTER & BRUMFIELD, Princeton, Indiana. ADV. PG. 58. (h)
Ⓥ Price Electric Corp., Frederick, Md. (h)
Ⓥ SERVO-TEK PRODUCTS CO., 1 Sudano Ave., Paterson 1, N. J. ADV. PG. 187.
Ⓥ SIGMA INSTRUMENTS, INC., 80 Ceylon St., Boston 22, Mass. ADV. PG. 195. (h)
Ⓥ Signal Engineering & Mfg. Co., 154-6 W. 14th St., New York, N. Y.
Ⓥ Standard Electrical Products Co., 402 E. 1st St., Dayton, Ohio. (h)
Ⓥ Sterling Engineering Co., Laconia, N. H. (h)
Ⓥ Struthers-Dunn, Inc., 150 N. 13th St., Philadelphia 7, Pa. (h)
Ⓥ Vare Mfg. Co., Inc., Box 638, Garland, Texas.
Ⓥ WARD LEONARD ELECTRIC CO., 31 South St., Mt. Vernon, N. Y. ADV. PG. 51, 52. (h)
Ⓥ Warrick Co., Charles F., 16251 Hamilton Ave., Detroit 3, Mich.
Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

RELAYS—*Sequence*

Ⓥ ALLIED CONTROL CO., INC., 2 East End Ave., New York 21, N. Y. ADV. PG. 98, 99. (h)
Ⓥ Autocall Co., The, Shelby, Ohio.
Ⓥ Automatic Electric Sales Corp, 1033 W. Van Buren St., Chicago 7, Ill. (h)
Ⓥ Clare & Co., C. P., 4719 Sunnyside Ave., Chicago 30, Ill. (h)
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ LELAND, INC., G. H., 123 Webster Ave., Dayton 2, Ohio. ADV. PG. 246, 247.
Ⓥ Minneapolis-Honeywell Regulator Co., 2753 Fourth Avenue, S., Minneapolis, Minn.
Ⓥ PHILLIPS CONTROL CORP., 84 W. Jefferson St., Joliet, Ill. ADV. PG. 230. (h)
Ⓥ Price Electric Corp., Frederick, Md. (h)
Ⓥ Signal Engineering & Mfg. Co., 154-6 W. 14th St., New York, N. Y.
Ⓥ Struthers-Dunn, Inc., 150 N. 13th St., Philadelphia 7, Pa. (h)
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

RELAYS—*Shock-Resisting*

Ⓥ Advance Electric & Relay Co., 2435 Naomi St., Burbank, Calif. (h)
Ⓥ ALLIED CONTROL CO., INC., 2 East End Ave., New York 21, N. Y. ADV. PG. 98, 99. (h)
Ⓥ American Relay & Controls, Inc., 4901 W. Flournoy St., Chicago 44, Ill. (h)
Ⓥ Automatic Electric Sales Corp., 1033 W. Van Buren St., Chicago 7, Ill. (h)
Ⓥ Automatic Switch Co., 391 Lakeside Ave., Orange, N. J.
Ⓥ Clare & Co., C. P., 4719 Sunnyside Ave., Chicago 30, Ill. (h)
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18. (h)
Ⓥ KURMAN ELECTRIC CO., INC., 35-18 37th St., Long Island City 1, N. Y. ADV. PG. 214.
Ⓥ Leach Relay Co., 5915 Avalon Blvd., Los Angeles 3, Calif. (h)
Ⓥ Magnetic Devices, Inc., 712 East St., Frederick, Md.
Ⓥ PHILLIPS CONTROL CORP., 84 W. Jefferson St., Joliet, Ill. ADV. PG. 230. (h)
Ⓥ POTTER & BRUMFIELD, Princeton, Indiana. ADV. PG. 58. (h)
Ⓥ Price Electric Corp., Frederick, Md. (h)
Ⓥ SIGMA INSTRUMENTS, INC., 80 Ceylon St., Boston 22, Mass. ADV. PG. 195. (h)
Ⓥ Signal Engineering & Mfg. Co., 154-6 W. 14th St., New York, N. Y.
Ⓥ Struthers-Dunn, Inc., 150 N. 13th St., Philadelphia 7, Pa. (h)
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

RELAYS—*Snap-Action*

Ⓥ Adams & Westlake Co., Michigan St., Elkhart, Ind. (h)
Ⓥ ALLIED CONTROL CO., INC., 2 East End Ave., New York 21, N. Y. ADV. PG. 98, 99. (h)
Ⓥ American Relay & Controls, Inc., 4901 W. Flournoy St., Chicago 44, Ill. (h)
Ⓥ Assembly Products, Inc., Chagrin Falls 6, Ohio.
Ⓥ Automatic Electric Sales Corp., 1033 W. Van Buren St., Chicago 7, Ill. (h)
Ⓥ Clare & Co., C. P., 4719 Sunnyside Ave., Chicago 30, Ill. (h)
Ⓥ Cook Electric Co., 2700 Southport Ave., Chicago 14, Ill. (h)
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ GUARDIAN ELECTRIC MFG. CO., 1621 W. Walnut St., Chicago 12, Ill. ADV. PG. 31. (h)
Ⓥ KURMAN ELECTRIC CO., INC., 35-18 37th St., Long Island City 1, N. Y. ADV. PG. 214.
Mack Electrical Devices, Inc., 43 Glenside Ave., Wyncote, Pa. (h)
Ⓥ Minneapolis-Honeywell Regulator Co., 2753 Fourth Avenue, S., Minneapolis, Minn.
Ⓥ PHILLIPS CONTROL CORP., 84 W. Jefferson St., Joliet, Ill. ADV. PG. 230. (h)
Ⓥ POTTER & BRUMFIELD, Princeton, Indiana. ADV. PG. 58. (h)
Ⓥ Price Electric Corp., Frederick, Md. (h)
Ⓥ SIGMA INSTRUMENTS, INC., 80 Ceylon St., Boston 22, Mass. ADV. PG. 195. (h)
Ⓥ Signal Engineering & Mfg. Co., 154-6 W. 14th St., New York, N. Y.
Ⓥ Standard Electrical Products Co., 402 E. 1st St., Dayton, Ohio. (h)
Ⓥ Struthers-Dunn, Inc., 150 N. 13th St., Philadelphia 7, Pa. (h)
Ⓥ Warrick Co., Charles F., 16251 Hamilton Ave., Detroit 3, Mich.

RELAYS—*Stepping*

Ⓥ ALLIED CONTROL CO., INC., 2 East End Ave., New York 21, N. Y. ADV. PG. 98, 99. (h)
Ⓥ Autocall Co., The, Shelby, Ohio.
Ⓥ Automatic Electric Sales Corp., 1033 W. Van Buren St., Chicago 7, Ill. (h)
Ⓥ Clare & Co., C. P., 4719 Sunnyside Ave., Chicago 30, Ill. (h)
Ⓥ FEDERAL TELEPHONE & RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.
Ⓥ GUARDIAN ELECTRIC MFG. CO., 1621 W. Walnut St., Chicago 12, Ill. ADV. PG. 31. (h)
Ⓥ LELAND, INC., G. H., 123 Webster St., Dayton 2, Ohio. ADV. PG. 246, 247.
Ⓥ Price Electric Corp., Frederick, Md. (h)
Ⓥ Signal Engineering & Mfg. Co., 154-6 W. 14th St., New York, N. Y.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ Struthers-Dunn, Inc., 150 N. 13th St., Philadelphia 7, Pa. (h)

RELAYS—*Telephone*

Ⓥ Adams & Westlake Co., Michigan St., Elkhart, Ind. (h)
Ⓥ Advance Electric & Relay Co., 2435 Naomi St., Burbank, Calif. (h)
Ⓥ AIRCRAFT RADIO CORP., Boonton, N. J. ADV. PG. 198, 199. (h)
Ⓥ ALLIED CONTROL CO., INC., 2 East End Ave., New York 21, N. Y. ADV. PG. 98, 99. (h)
Ⓥ American Relay & Controls, Inc., 4901 W. Flournoy St., Chicago 44, Ill. (h)
Ⓥ Autocall Co., The, Shelby, Ohio.
Ⓥ Automatic Electric Sales Corp., 1033 W. Van Buren St., Chicago 7, Ill. (h)
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ Clare & Co., C. P., 4719 Sunnyside Ave., Chicago 30, Ill. (h)
Ⓥ Control Corp., 718 Central Ave., Minneapolis 14, Minn.
Ⓥ Cook Electric Co., 2700 Southport Ave., Chicago 14, Ill.
Ⓥ FEDERAL TELEPHONE & RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.
Ⓥ GUARDIAN ELECTRIC MFG. CO., 1621 W. Walnut St., Chicago 12, Ill. ADV. PG. 31. (h)
Ⓥ Kellogg Switchboard & Supply Co., 6650 S. Cicero Ave., Chicago 38, Ill.
Ⓥ KURMAN ELECTRIC CO., INC., 35-18 37th St., Long Island City 1, N. Y. ADV. PG. 214.
Ⓥ North Electric Mfg. Co., 501 S. Market St., Galion, Ohio.
Ⓥ PHILLIPS CONTROL CORP., 84 W. Jefferson St., Joliet, Ill. ADV. PG. 230. (h)
Ⓥ POTTER & BRUMFIELD, Princeton, Indiana. ADV. PG. 58. (h)
Ⓥ Price Electric Corp., Frederick, Md. (h)
Ⓥ R. B. M. Div. Essex Wire Corp., Logansport, Ind. (h)
Ⓥ Signal Engineering & Mfg. Co., 154-6 W. 14th St., New York, N. Y.
Ⓥ Standard Electrical Products Co., Dayton 3, Ohio. (h)
Ⓥ Sterling Engineering Co., Laconia, N. H. (h)

RELAYS—*Temperature Compensated*

Ⓥ ALLIED CONTROL CO., INC., 2 East End Ave., New York 21, N. Y. ADV. PG. 98, 99. (h)
Ⓥ Clare & Co., C. P., 4719 Sunnyside Ave., Chicago 30, Ill. (h)
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ KURMAN ELECTRIC CO., INC., 35-18 37th St., Long Island City 1, N. Y. ADV. PG. 214.
Mack Electrical Devices Inc., 43 Glenside Ave., Wyncote, Pa. (h)
Ⓥ Molded Insulation Co., Aircraft Control Div., 335 E. Price St., Philadelphia, Pa.
Ⓥ PHILLIPS CONTROL CORP., 82 W. Jefferson St., Joliet, Ill. ADV. PG. 230.
Ⓥ SIGMA INSTRUMENTS, INC., 80 Ceylon St., Boston 22, Mass. ADV. PG. 195. (h)
Ⓥ Signal Engineering & Mfg. Co., 154-6 W. 14th St., New York, N. Y.

RELAYS—*Time Delay*

Ⓥ Adams & Westlake Co., Michigan St., Elkhart, Ind.
Ⓥ Advance Electric & Relay Co., 2435 Naomi St., Burbank, Calif. (h)
Ⓥ Allen-Bradley Co., 136 W. Greenfield Ave., Milwaukee 4, Wis.
Ⓥ ALLIED CONTROL CO., INC., 2 East End Ave., New York 21, N. Y. ADV. PG. 98, 99. (h)
Ⓥ AMERICAN GAS ACCUMULATOR CO., 1029 Newark Ave., Elizabeth, N. J. ADV. PG. 66.
Ⓥ American Relay & Controls, Inc., 4901 W. Flournoy St., Chicago 44, Ill. (h)

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

Ⓥ AMPERITE CO., 561 Broadway, New York 12, N. Y. ADV. PG. 215.
Ⓥ Autocar Co., The, Shelby, Ohio.
Ⓥ Automatic Electric Sales Co., 1033 W. Van Buren St., Chicago 7, Ill.
Ⓥ Automatic Temperature Control Co., Inc., 5232 Pulaski Ave., Philadelphia 44, Pa.
Ⓥ Clare & Co., C. P., 4719 Sunnyside Ave., Chicago 30, Ill.
Ⓥ Clark Controller Co., 1146 E. 152nd St., Cleveland 10, Ohio.
Ⓥ Cook Electric Co., 2700 Southport Ave., Chicago 14, Ill.
Ⓥ CRAMER CO., INC., R. W., Box 13, Centerbrook, Conn. ADV. PG. 208.
Ⓥ Dely Co., S. J., Box 65, W. Englewood, N. J.
Ⓥ Durakool, Inc., 1013 N. Main St., Elkhart, Ind.
Ⓥ Eagle Signal Corp., Moline, Illinois.
Ⓥ EDISON, INC., THOMAS A., Instrument Div., West Orange, N. J. ADV. PG. 329.
Ⓥ Electronic Control Corp., 1573 E. Forest St., Detroit, Mich.
Ⓥ Ervens Labs., Inc., 2 East End Ave., New York 21, N. Y.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ GUARDIAN ELECTRIC MFG. CO., 1621 W. Walnut St., Chicago 12, Ill. ADV. PG. 81.
Ⓥ HAYDON CO., A. W., THE, 232 N. Elm St., Waterbury, Conn. ADV. PG. 216.
Ⓥ HAYDON MFG. CO., INC., 584 E. Elm St., Torrington, Conn. ADV. PG. 102, 103.
Ⓥ Industrial Electronics Co., Inc., Hanover, Mass.
Ⓥ Industrial Timer Corp., 115 Edison Pl., Newark 5, N. J.
Ⓥ KURMAN ELECTRIC CO., INC., 35-18 37th St., Long Island City 1, N. Y. ADV. PG. 214.
Ⓥ L. A. Relay Co., 5915 Avalon Blvd., Los Angeles 3, Calif.
Ⓥ Leecraft Mfg. Co., 57 W. 19th St., New York 11, N. Y.
Ⓥ Leeds Laboratories, 30 E. 10th St., New York 3, N. Y.
Ⓥ Lumenite Electric Co., 402 S. Dearborn St., Chicago 5, Ill.
Ⓥ PHILLIPS CONTROL CORP., 84 W. Jefferson St., Joliet, Ill. ADV. PG. 230.
Ⓥ POTTER & BRUMFIELD, Princeton, Ind. ADV. PG. 58.
Ⓥ Price Electric Corp., Frederick, Md.
Ⓥ SIGMA INSTRUMENTS, INC., 60 Ceylon St., Boston 22, Mass. ADV. PG. 195.
Ⓥ Signal Engineering & Mfg. Co., 154-6 W. 14th St., New York, N. Y.
Ⓥ Spencer Thermostat Co., 34 Forest St., Attleboro, Mass.
Ⓥ Standard Electrical Products Co., 402 E. 1st St., Dayton, Ohio.
Ⓥ Sterling Engineering Co., Laconia, N. H.
Ⓥ Struthers-Dunn, Inc., 150 N. 13th St., Philadelphia 7, Pa.
Ⓥ Wiseel Co., George, 413 Market St., Newark 5, N. J.
Ⓥ Wood Mfg. Co., Box 430, Concord, Tex.
Ⓥ WARD LEONARD ELECTRIC CO., 41 South St., Mt. Vernon, N. Y. ADV. PG. 51, 52.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

RELAYS—*Transfer*

Ⓥ Adams & Westlake Co., Michigan St., Elkhart, Ind.
Ⓥ Advance Electric & Relay Co., 2435 Navarre St., North Bend, Calif.
Ⓥ ALLIED CONTROL CO., INC., 2 East End Ave., New York 21, N. Y. ADV. PG. 99.
Ⓥ American Relay & Controls, Inc., 4901 W. Fifteenth St., Chicago 44, Ill.
Ⓥ Automatic Electric Sales Corp., 1033 W. Van Buren St., Chicago 7, Ill.
Ⓥ Automatic Switch Co., 391 Lakeside Ave., Orange, N. J.
Ⓥ Clare & Co., C. P., 4719 Sunnyside Ave., Chicago 30, Ill.
Ⓥ Cutler-Hammer, Inc., Milwaukee 1, Wis.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ JENNINGS RADIO MFG. CO., 3witch E. Wilson St., San Jose 12, Calif. ADV. PG. 214, 215.
Ⓥ KURMAN ELECTRIC CO., INC., 35-18 37th St., Long Island City 1, N. Y. ADV. PG. 214.
Ⓥ Leach Relay Co., 5915 Avalon Blvd., Los Angeles 3, Calif.
Ⓥ Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Roberts Aves., Philadelphia 44, Pa.
Ⓥ PHILLIPS CONTROL CORP., 84 W. Jefferson St., Joliet, Ill. ADV. PG. 230.
Ⓥ POTTER & BRUMFIELD, Princeton, Indiana. ADV. PG. 58.
Ⓥ Price Electric Corp., Frederick, Md.
Ⓥ Signal Engineering & Mfg. Co., 154-6 W. 14th St., New York, N. Y.
Ⓥ Struthers-Dunn, Inc., 150 N. 13th St., Philadelphia 7, Pa.
Ⓥ WARD LEONARD ELECTRIC CO., 51 South St., Mt. Vernon, N. Y. ADV. PG. 51, 52.

RELAYS—*Vacuum Contact*

Ⓥ Clare & Co., C. P., 4719 Sunnyside Ave., Chicago 30, Ill. (hi)
Ⓥ Frei-McCullough, Inc., San Bruno, Calif.
Ⓥ JENNINGS RADIO MFG. CO., 1046 E. William St., San Jose 12, Calif. ADV. PG. 114, 215.
Ⓥ Jennings Switchboard & Supply Co., 6650 S. Cicero Ave., Chicago 38, Ill.
Mack Electrical Devices, Inc., 43 Glenside Ave., Wyncote, Pa. (hi)
Ⓥ Signal Engineering & Mfg. Co., 154-6 W. 14th St., New York, N. Y.
Sperti, Inc., Cincinnati, Ohio.

RELAYS—*Vibrating Reed Type*

Ⓥ AMERICAN TELEVISION & RADIO CO., 300 E. Fourth St., St. Paul 1, Minn. ADV. PG. 275.
Ⓥ Automatic Electric Sales Corp., 1033 W. Van Buren St., Chicago 7, Ill. (hi)
Ⓥ Biddle Co., James G., 1316 Arch St., Philadelphia 7, Pa.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ Control Corp., 718 Central Ave., Minneapolis 14, Minn.
Ⓥ KURMAN ELECTRIC CO., INC., 35-18 37th St., Long Island City 1, N. Y. ADV. PG. 214.
Ⓥ Signal Engineering & Mfg. Co., 154-6 W. 14th St., New York, N. Y.
Ⓥ Stevens-Arnold, Inc., 22 Elkins St., South Boston 27, Mass. (hi)
Vikar Corp., 7360 Huron River Drive, Dexter, Mich.

RESINS

See Insulating Compounds

RESISTANCE SPECIALTIES

Atlas Electric Products Co., P. O. Box 1591, Erie, Pa.
Ⓥ Berkshire Laboratories, P. O. Box 70, Concord, Mass.
Ⓥ BOND ELECTRONICS CORP., 88 Franklin Place, Summit, N. J. ADV. PG. 255.
Ⓥ CIMA CORP., 91 Boylston St., Jamaica Plains 30, Mass. ADV. PG. 249.
Ⓥ CINEMA ENGINEERING CO., 1510 W. Verdugo Ave., Burbank, Calif. ADV. PG. 186.
Ⓥ CLAROSTAT MFG. CO., INC., Dover, N. H. ADV. PG. 237.
Ⓥ Daven Co., 191 Central Ave., Newark 4, N. J.
Ⓥ DEJUR-AMSCO CORP., Northern Blvd. at 45th St., Long Island City 1, N. Y. ADV. PG. 267.
Ⓥ ERIE RESISTOR CORP., 644 W. 12th St., Erie, Pa. ADV. PG. 47.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ HELIPOT CORP., 916 Meridan Ave., So. Pasadena, Calif. ADV. PG. 101.
Ⓥ INSTRUMENT RESISTORS CO., 1036 Commerce Ave., Union, N. J. ADV. PG. 174, 175.
Ⓥ INTERNATIONAL RESISTANCE CO., 401 N. Broad St., Philadelphia 8, Pa. ADV. PG. 88, 89.
Ⓥ MEPCO, INC., 35-37 Abbett Ave., Morristown, N. J. ADV. PG. 196.
Ⓥ Ohio Carbon Co., 12508 Berea Rd., Cleveland 11, Ohio.
Ⓥ OHMITE MFG. CO., 4835 W. Flournoy St., Chicago 44, Ill. ADV. PG. 83.
Ⓥ Plastics & Electronics Co., 272 Northland Ave., Buffalo 8, N. Y.
Ⓥ Precision Resistor Co., 334 Badger Ave., Newark 8, N. J.
Ⓥ RESISTANCE PRODUCTS CO., 714 Race St., Harrisburg, Pa. ADV. PG. 190.
Ⓥ Robinson Co., 3751 Ridge Ave., Philadelphia, Pa.
Ⓥ SHALLCROSS MFG. CO., 10 Jackson Ave., Collingdale, Pa. ADV. PG. 221.
Ⓥ Tech Laboratories, Inc., Bergen & Edsall Blvds., Palisades Park, N. J.
Ⓥ Ward-Leonard Electronic Components, Inc., 234 E. 46th St., New York 17, N. Y.

RESISTORS

Fixed Composition

1. **Low wattage . . .**
2. **Temperature sensitive . . .**
3. **High frequency . . .**
4. **High megohm . . .**
5. **High voltage . . .**
6. **High wattage . . .**
7. **Voltage sensitive . . .**
8. **Resistor-suppressor . . .**

Variable Composition

9. **Controls & potentiometers . . .**

Wire Wound

10. **2 Watts and under . . .**
11. **4 to 35 Watts . . .**
12. **40 to 500 Watts . . .**
13. **500 to 1500 Watts . . .**
14. **Precision low voltage . . .**
15. **Precision high voltage . . .**
16. **Rf non-inductive . . .**

Variable Wire Wound

17. **4 Watts and under . . .**
18. **5 to 25 Watts . . .**
19. **25 Watts and over . . .**
20. **500 Watts and over . . .**
21. **Slide wire . . .**
22. **Adjustable . . .**
23. **Rheostat—potentiometer types . . .**

Note: (h) indicates hermetically sealed types.

Ⓥ Acme Electric Heating Co., 1217 Washington St., Boston, Mass. 12-13. (h)
Ⓥ Allen-Bradley Co., 136 W. Greenfield Ave., Milwaukee 4, Wis. 1-9.
Ⓥ Amalgamated Electronics, Electronic Road, Clinton Corners, N. Y. 23.
Ⓥ Associated Research Inc., 3780 W. Belmont Ave., Chicago 18, Ill. 10.
Ⓥ Barber-Colman Company, Rockford, Ill. 2.
Ⓥ BOND ELECTRONICS CORP., 88 Franklin Place, Summit, N. J. 10-11-14-15-16. ADV. PG. 255.
Ⓥ BRADLEY LABS., 82 Meadow St., New Haven, Conn. 2-7. ADV. PG. 192.
Ⓥ BROWN ELECTRO-MEASUREMENT CORP., 4637 SE Hawthorne Blvd., Portland 15, Ore. 10-14-17-18-21-22-23. ADV. PG. 276.
Ⓥ Carborundum Co., Globar Div., Niagara Falls, N. Y. 1-2-5-6-7-8.
Ⓥ Carter Parts Company, 213 Institute Place, Chicago 10, Ill. 9-10.
Ⓥ CENTRALAB DIVISION, GLOBE-UNION INC., 900 Keefe Ave., Milwaukee 1, Wis. 9-17-18-19-23. ADV. PG. 64, 65.
Ⓥ Chicago Telephone Supply Corp., 1142 W. Beardsley Ave., Elkhart, Ind. 9-17.
Ⓥ CIMA CORP., 91 Boylston St., Jamaica Plains 30, Mass. 11-12-13-14-15-16. ADV. PG. 249.
Ⓥ CINEMA ENGINEERING CO., 1510 W. Verdugo Ave., Burbank, Calif. 10-11-14-21-23. ADV. PG. 186.
Ⓥ Clare Controller Co., 1146 E. 152nd St., Cleveland 10, Ohio. 12-13.
Ⓥ CLAROSTAT MFG. CO., INC., Dover, N. H. 9-10-11-12-14-15-16-17-18-19-21-22-23. ADV. PG. 237. (hi)
Ⓥ Computing Devices Inc., 61 Bergen St., Brooklyn 2, N. Y. 11-12-13-14-16. (hi)
Ⓥ Consolidated Wire & Associated Companies, 1635 S. Clinton St., Chicago 16, Ill. 3-10-14.
Ⓥ Continental Carbon, Inc., 13900 Lorain Ave., Cleveland 11, Ohio. 1-8-10.
Ⓥ Daven Co., 191 Central Ave., Newark 4, N. J. 10-14-16-22-23. (hi)
Ⓥ Dearl Electric Co., Cape Girardeau, Mo. 11-14-18-19.
Ⓥ DEJUR-AMSCO CORP., Northern Blvd. at 45th St., Long Island City 1, N. Y. 17-18-19-23. ADV. PG. 267.
Ⓥ ELECTRICAL REACTANCE CORP., Elm St., Franklinville, N. Y. 11. ADV. PG. 28, 29.
Ⓥ Elliott Mfg. Co., 218 Prospect Ave., Binghamton, N. Y. 13.
Ⓥ ERIE RESISTOR CORP., 644 W. 12th St., Erie, Pa. 1-8. ADV. PG. 47.
Ⓥ Fairchild Camera & Instrument Corp., 88-06 Van Wyck Blvd., Jamaica 1, N. Y. 23.
Ⓥ Fairtest Instrument Corp., 14-02 Broadway, Long Island City 6, N. Y. 10-14.
Ⓥ Ford Engineering Co., 2738 Colorado Blvd., Los Angeles 41, Calif. 23.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. 11-13-18-20-22. ADV. PG. 5 to 18.
Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. 10-14-16-17-18-22-23. ADV. PG. 48, 49.
Ⓥ Gramm & Co., Inc., 285 W. Colorado St., Pasadena 1, Calif. 17-23.
Ⓥ Greenleaf Co., Box 168, Chicago PO, Ill. 10-14.
Ⓥ HANDWICK, HINDLE INC., 40 Harmon Street, Newark, N. J. 11-12-18-19-20-21-22-23. ADV. PG. 119.
Ⓥ HELIPOT CORP., 916 Meridan Ave., South Pasadena, Calif. 17-18-23. ADV. PG. 101.
Ⓥ I-T-E CIRCUIT BREAKER CO., 19th and Hamilton Sts., Philadelphia 30, Pa. 10-11-12-17-18-19-22. ADV. PG. 40, 41.
Ⓥ INSTRUMENT RESISTORS CO., 1036 Commerce Ave., Union, N. J. 3-4-7-8-10-14-15-16. ADV. PG. 174, 175.
Ⓥ INTERNATIONAL RESISTANCE CO., 401 N. Broad St., Philadelphia 8, Pa. 1-3-4-5-6-7-8-9-10-11-12-14-15-16-17-18-19-22-23. ADV. PG. 88, 89. (h)
Ⓥ K. F. Development Co., 820 Woodside Way, San Mateo, Calif. 23.
Ⓥ KEYSTONE CARBON CO., INC., St. Marys, Pa. 2. ADV. PG. 42.
Ⓥ Kuprian Mfg. Co., Binghamton, N. Y. 13.
Ⓥ Lectrohm, Inc., 5939 Archer Ave., Chicago 38, Ill. 2-10-14-15.

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

Ⓥ Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa. 10-14-16-21-22-23.
Ⓥ MACDONALD & CO., INC., W. S., 33 University Rd., Cambridge 38, Mass. 10-14. ADV. PG. 218.
Ⓥ Mallory & Co., Inc., P. R., 3029 E. Washington St., Indianapolis 6, Ind. 2-3-10-14-15-17.
Ⓥ MEPCO INC., 35-37 Abbett Ave., Morristown, N. J. 10-14-15. ADV. PG. 196.
Ⓥ Micamold Radio Corp., 1087 Flushing Ave., Brooklyn 6, N. Y. 10.
Ⓥ Milwaukee Resistor Co., 700 W. Virginia St., Milwaukee 4, Wis. 10-12-18-19-22.
Ⓥ Model Engineering & Mfg., Inc., Huntington, Ind. 11-12-18-19-22.
Ⓥ Muter Co., 1255 S. Michigan Ave., Chicago, Ill. 11-17-18-23.
Ⓥ Ohio Carbon Co., 12508 Berea Rd., Cleveland 11, Ohio. 5-7-8-10-11-12-22.
Ⓥ OHMITE MFG. CO., 4835 W. Flournoy St., Chicago 44, Ill. 3-9-10-11-12-13-14-16-18-19-20-21-22. ADV. PG. 83. (h)
Ⓥ Plastics & Electronics Co., 272 Northland Ave., Buffalo 8, N. Y. 4-5.
Ⓥ Precision Resistor Co., 334 Badger Ave., Newark 8, N. J. 10-11-14-15. (h)
Ⓥ RESISTANCE PRODUCTS CO., 514 Race St., Harrisburg 2, Pa. 3-4-5-6-10-14. ADV. PG. 190.
Ⓥ Resistors, Inc., 5226 W. 26th St., Chicago 50, Ill. 11-12-18-19.
Ⓥ REX RHEOSTAT CO., 3 Foxhurst Rd., Baldwin, N. Y. 12-13-19-21-22-23. ADV. PG. 255.
Ⓥ Rubicon Co., 3751 Ridge Ave., Philadelphia, Pa. 14.
Ⓥ St. Mary's Carbon Co., State Rd., St. Marys, Pa. 1-2-5-6-7-8.
Ⓥ SHALLCROSS MFG. CO., 10 Jackson Ave., Collingdale, Pa. 10-11-12-14-15-16-21. ADV. PG. 221. (h)
Ⓥ Speer Resistor Corp., St. Marys, Pa. 1-2-5-6-7-8.
Ⓥ Sprague Electric Co., North Adams, Mass. 4-5-6-11-12-14-15. (h)
Ⓥ STACKPOLE CARBON CO., St. Marys, Pa. 1. ADV. PG. 166, 167.
Ⓥ Sterling Engineering Co., Laconia, N. H. 10-14.
Ⓥ STUPAKOFF CERAMIC & MFG. CO., Latrobe, Pa. 2-7. ADV. PG. 147.
Ⓥ Tech Laboratories, Inc., Bergen & Edsall Blvds., Palisades Park, N. J. 3-9-14-16-17-23.
Ⓥ Technology Instrument Corp., 1058 Main St., Waltham 54, Mass. 17-18-21-22-23. (h)
Ⓥ VICTOREEN INSTRUMENT CO., 5806 Hough Ave., Cleveland 3, Ohio. 3-4. ADV. PG. 241.
Ⓥ WARD LEONARD ELECTRIC CO., 31 South St., Mt. Vernon, N. Y. 11-12-13-16-19-20-22-23. ADV. PG. 51, 52.
Ⓥ Welwyn Electronic Components, Inc., 234 E. 46th St., New York 17, N. Y. 11-12.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. 3-10-23. ADV. PG. 77.
Ⓥ White Dental Mfg. Co., S. S., Industrial Div., 10 East 40th St., New York 16, N. Y. 1-4-5.
Ⓥ Wilcor Products Inc., 2882 Detroit Ave., Cleveland 13, Ohio. 10-11.
Ⓥ Wirt Co., 5221 Greene St., Philadelphia, Pa. 10-11-12-13-17-23.

RHEOSTATS

Acme Electric Heating Co., 1217 Washington St., Boston, Mass.
Ⓥ BROWN ELECTRO-MEASUREMENT CORP., 4637 SE Hawthorne Blvd., Portland 15, Ore. ADV. PG. 276.
Ⓥ CENTRALAB, DIV. GLOBE UNION INC., 900 E. Keefe Ave., Milwaukee 1, Wis. ADV. PG. 64, 65.
Ⓥ CINEMA ENGINEERING CO., 1510 W. Verdugo Ave., Burbank, Calif. ADV. PG. 186.
Ⓥ Clark Controller Co., 1146 E. 152nd St., Cleveland 10, Ohio.
Ⓥ CLAROSTAT MFG. CO., INC., Dover, N. H. ADV. PG. 227.
Ⓥ Columbia Electric Mfg. Co., 4519 Hamilton Ave., N.E., Cleveland 14, Ohio.
Ⓥ Cutler-Hammer, Inc., 411 No. 12th St., Milwaukee 1, Wis.
Ⓥ Dumont Co., 133 Central Ave., Newark 4, N. J.
Ⓥ DEJUR-AMSCO CORP., Northern Blvd. at 45th St., Long Island City 1, N. Y. ADV. PG. 267.
Ⓥ Electro Specialty Co., Philadelphia 40, Pa.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. 48, 49.
Ⓥ HARDWICK, HINDLE INC., 40 Hermon St., Newark 5, N. J. ADV. PG. 119.
Ⓥ HELIPOT CORP., 916 Meridian Ave., S. Pasadena, Calif. ADV. PG. 101.
Ⓥ INTERNATIONAL RESISTANCE CO., 401 N. Broad St., Philadelphia 8, Pa. ADV. PG. 88, 89.
Ⓥ Mallory & Co., Inc., P. R., 3029 E. Washington St., Indianapolis 6, Ind.
Ⓥ NATIONAL CARBON DIVISION, Union Carbide & Carbon Corp., 30 E. 42nd St., New York, N. Y. ADV. PG. 109.
Ⓥ National Electric Controller Co., 5307 Ravenswood Ave., Chicago, Ill.
Ⓥ OHMITE MFG. CO., 4835 W. Flournoy St., Chicago 44, Ill. ADV. PG. 83.
Ⓥ REX RHEOSTAT CO., 3 Foxhurst Rd., Baldwin, N. Y. ADV. PG. 255.
Ⓥ Rubicon Co., 3751 Ridge Ave., Philadelphia, Pa.
Ⓥ WARD LEONARD ELECTRIC CO., 31 South St., Mount Vernon, N. Y. ADV. PG. 51, 52.

RHEOSTATS—*Slide Wire*

Ⓥ BROWN ELECTRO-MEASUREMENT CORP., 4637 SE Hawthorne Blvd., Portland 15, Ore. ADV. PG. 276.
Ⓥ Central Scientific Co., 1700 Irving Park Rd., Chicago 13, Ill.
Ⓥ CIMA CORP., 91 Boylston St., Jamaica Plains 30, Mass. ADV. PG. 269.
Ⓥ CINEMA ENGINEERING CO., 1510 W. Verdugo Ave., Burbank, Calif. ADV. PG. 186.
Ⓥ CLAROSTAT MFG. CO., INC., Dover, N. H. ADV. PG. 227.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ HARDWICK, HINDLE INC., 40 Hermon St., Newark 5, N. J. ADV. PG. 119.
Ⓥ HELIPOT CORP., 916 Meridian Ave., So. Pasadena, Calif. ADV. PG. 101.
Ⓥ Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
Ⓥ OHMITE MFG. CO., 4835 W. Flournoy St., Chicago 44, Ill. ADV. PG. 83.
Ⓥ REX RHEOSTAT CO., 3 Foxhurst Rd., Baldwin, N. Y. ADV. PG. 255.
Ⓥ Rubicon Co., 3751 Ridge Ave., Philadelphia, Pa.
Ⓥ Technology Instrument Corp., 1058 Main St., Waltham 54, Mass.
Ⓥ Welch Scientific Co., W. M., 1515 Sedgwick St., Chicago 10, Ill.

RINGS—*Carbon Packing*

Ⓥ Crane Packing Co., 1800 Cuyler Ave., Chicago 13, Ill.
Electro-Nite Carbon Co., 1133 E. Columbia Ave., Philadelphia, Pa.
Ⓥ GRAPHITE METALLIZING CORP., 1041 Nepperhan Ave., Yonkers 3, N. Y. ADV. PG. 76.
Ⓥ NATIONAL CARBON DIVISION, Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y. ADV. PG. 109.
Ⓥ Pure Carbon Co., St. Marys, Pa.
Ⓥ St. Mary's Carbon Co., State Rd., St. Marys, Pa.
Ⓥ Speer Carbon Co., Lincoln Ave., St. Marys, Pa.
Ⓥ STACKPOLE CARBON CO., St. Marys, Pa. ADV. PG. 166, 167.

RINGS—*Collector*

Ⓥ Baker & Co., Inc., 113 Astor St., Newark 5, N. J.
Ⓥ Baldwin Locomotive Works, Philadelphia 42, Pa.
Ⓥ GRAPHITE METALLIZING CORP., 1041 Nepperhan Ave., Yonkers 3, N. Y. ADV. PG. 76.
Ⓥ Kent Co., F. C., 64-72 Howard St., Irvington, N. J.
Ⓥ MAKEPEACE CO., D. E., Attleboro, Mass. ADV. PG. 97.

RINGS—*Oil Sealing*

Ⓥ Amplex Division, Chrysler Corp., Detroit 31, Mich.
Ⓥ Armstrong Cork Co., Lancaster, Pa.
Ⓥ Crane Packing Co., 1800 Cuyler Ave., Chicago 13, Ill.
Eastern Metals Industries, 250 W. 54th St., New York 19, N. Y.
Ⓥ Garlock Packing Co., Palmyra, N. Y.
Ⓥ GRAPHITE METALLIZING CORP., 1041 Nepperhan Ave., Yonkers 3, N. Y. ADV. PG. 76.
Ⓥ Johns-Manville, 22 E. 40th St., New York 16, N. Y.
Ⓥ Pure Carbon Co., St. Marys, Pa.

RINGS—*Retaining*

Ⓥ Barnes-Gibson-Raymond Div. of Associated Spring Corp., 6400 Miller Ave., Detroit 11, Mich.
Ⓥ Cuyahoga Spring Co., 10272 Berea Rd., Cleveland, Ohio.
Eastern Metals Industries, 250 W. 54th St., New York 19, N. Y.
Ⓥ Garrett Co., Inc., George K., D and Tioga Sts., Philadelphia 34, Pa.
Ⓥ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
Ⓥ Grummer & Sons Inc., L. F., 389 Union St., Allentown 2, Pa.
Ⓥ National Lock Washer Co., 40 Hermon St., Newark 5, N. J.
Ⓥ Waldes Kohinoor Inc., 47-16 Austel Place, Long Island City 1, N. Y.

RIVETS

Ⓥ American Laubscher Corp., 333 W. 52nd St., New York 19, N. Y.
Ⓥ Atlas Tack Corp., Pleasant St., Fairhaven, Mass.
Ⓥ Autoscrew Co., 216-222 W. 18th St., New York, N. Y.
Ⓥ BLAKE & JOHNSON CO., Waterville 48, Conn. ADV. PG. 223.
Ⓥ Chase Brass & Copper Co., Inc., Waterbury 91, Conn.
Ⓥ Cherry Rivet Co., 231 Winston St., Los Angeles 13, Calif.
Ⓥ Chicago Rivet & Machine Co., 9600 W. Jackson Blvd., Chicago, Ill.
Ⓥ du Pont de Nemours & Co., Inc., E. I., Wilmington, Delaware.
Ⓥ FEDERAL SCREW PRODUCTS INC., 224 Huron St., Chicago 10, Ill. ADV. PG. 271.
Ⓥ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
Gries Reproducer Corp., 100 Willow Ave., New York 54, N. Y.
Ⓥ Harper Co., H. M., 8200 Lehigh Ave., Morton Grove, Ill.
Ⓥ Hassall Inc., John, Clay & Oakland Sts., Brooklyn 22, N. Y.
Ⓥ INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
Ⓥ Lamson & Sessions Co., 1971 W. 85th St., Cleveland, Ohio.
Ⓥ Milford Rivet & Machine Co., Milford, Conn.
Ⓥ National Screw & Mfg. Co., The, Cleveland 4, Ohio.
Ⓥ Progressive Mfg. Co., 50 Norwood St., Torrington, Conn.
Ⓥ Republic Steel Corp., Republic Bldg., Cleveland 1, Ohio.
Ⓥ Simpson Co., Inc., Edwin B., 74 Franklin Ave., Brooklyn 5, N. Y.
Tubular Rivet & Stud Co., Wallaston 70, Mass.
Ⓥ United Shoe Machinery Corp., 142 Federal St., Boston, Mass.

RUBBER

See Insulation Materials

RUBBER—*Conductive*

See Insulation Materials

ROOMS—*Screen*

Ⓥ ACE ENGINEERING & MACHINE CO., INC., 3642 N. Lawrence St., Philadelphia 40, Pa. ADV. PG. 271.

SCALES—*Oscilloscope*

Ⓥ Cossor (Canada) Ltd., 301-303 Windsor St., Halifax, N. S., Canada.
Ⓥ HEATH CO., Benton Harbor, Mich. ADV. PG. 279.
Ⓥ Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.
Printoid Inc., 95 Mercer St., New York, N. Y.
Ⓥ Supreme Inc., Greenwood, Miss.
Ⓥ WATERMAN PRODUCTS CO., INC., 2445-63 Emerald St., Philadelphia 25, Pa. ADV. PG. 252.

SCANNERS—*Reflected & Transmitted Light*

Ⓥ Acme Telectronix Div. of NEA Service, Inc., West Third & Lakeside, Cleveland 13, Ohio.
Ⓥ Airtectron, Inc., P. O. Box 151, Caldwell, N. J.
Ⓥ ALDEN PRODUCTS CO., 117 No. Main St., Brockton 64, Mass. ADV. PG. 235.
Ⓥ Fisher-Pierce Co., Inc., 70 Ceylon St., Boston 21, Mass.
Ⓥ Hogan Laboratories, Inc., 155 Perry St., New York 14, N. Y.
Ⓥ Industrial Electronics Co., Inc., Hanover, Mass.
Ⓥ McElroy Mfg. Corp., Littleton, Mass.
Ⓥ O'Connor & Co., John T., West Orange, N. J.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Photovolt Corp., 95 Madison Ave., New York 16, N. Y.
Ⓥ POTTER INSTRUMENT CO., INC., 115 Cutter Mill Rd., Great Neck, N. Y. ADV. PG. 204.
Ⓥ Press Wireless Mfg. Co., Inc., Cantiague Rd., Hicksville, L. I., N. Y.
Ⓥ TIMES FACSIMILE CORP., 243 W. 43rd St., New York 18, N. Y. ADV. PG. 50.

SCRAMBLERS—*Speech*

Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ KAY ELECTRIC CO., 14 Maple Ave., Pine Brook, N. J. ADV. PG. 193.
McMurdo Silver Co., Inc., 1240 Main St., Hartford 3, Conn.

SCREENS—*Television Projection*

Ⓥ Farrand Optical Co., Inc., Bronx Blvd. at 238th St., New York 66, N. Y.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.

SCREWS

Ⓥ AEROLITE ELECTRONIC HARDWARE CORP., 507 26th St., Union City, N. J. ADV. PG. 138.
Ⓥ ALLEN MFG. CO., Hartford, Conn. ADV. PG. 80.
Ⓥ Allmetal Screw Products Co., Inc., 33 Greene St., New York 13, N. Y.
Ⓥ Aluminum Co. of America, Gulf Bldg., Pittsburgh, Pa.
Ⓥ American Laubscher Corp., 333 W. 52nd St., New York 19, N. Y.

1950-1951 DIRECTORY of

Ⓥ Indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

Ⓥ American Screw Co., Willimantic, Conn.
Ⓥ Anthonow Co., 216-222 W. 18th St., New York, N. Y.
Bendix Radio Co., Inc., 145 Hudson St., New York, N. Y.
Ⓥ BLAKE & JOHNSON CO., Waterville 48, Conn. ADV. PG. 223.
Ⓥ Bristol Co., The, Waterbury 20, Conn.
Ⓥ Central Screw Co., 3501 Shields Ave., Chicago 9, Ill.
Ⓥ Chandler Products Co., 1491 Chardon Rd., Cleveland, Ohio.
Ⓥ Chase Brass & Copper Co., Inc., Waterbury 91, Conn.
Ⓥ Citation Products Co., 233 E. 146th St., New York 51, N. Y.
Ⓥ Continental Screw Co., New Bedford, Mass.
Ⓥ Curtis Screw Div., American Hardware Corp., High, Myrtle & Grove Sts., New Britain, Conn.
Ⓥ FEDERAL SCREW PRODUCTS INC., 224 W. Huron St., Chicago 10, Ill. ADV. PG. 271.
Ⓥ Ferron Co., P. J., 120 Pleasant St., Malden, Mass.
Ⓥ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
Ⓥ Harper Co., H. M., 8200 Lehigh Ave., Morton Grove, Ill.
Ⓥ INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
Ⓥ Lamson & Sessions Co., 1971 W. 85th St., Cleveland, Ohio.
Ⓥ Milford Rivet & Machine Co., Milford, Conn.
Ⓥ Morris Co., J. T., 594 Elm St., Southbridge, Mass.
Ⓥ National Screw & Mfg. Co., The, Cleveland 4, Ohio.
Ⓥ Parker-Kalon Corp., 200 Varick St., New York 14, N. Y.
Ⓥ Pheoll Mfg. Co., 6700 Roosevelt Rd., Chicago 50, Ill.
Ⓥ Progressive Mfg. Co., 155 Chestnut St., Providence, R. I.
Ⓥ PRECISION METAL PRODUCTS CO. OF MALDEN, 342 Eastern Ave., Malden 48, Mass. ADV. PG. 220.
Ⓥ Progressive Mfg. Co., 50 Norwood St., Torrington, Conn.
Ⓥ Shott Co., Walter L., 9306 Santa Monica Blvd., Beverly Hills, Calif.
Ⓥ Shurtleff Mfg. Co., Industrial Fastener Div., Waterbury, Conn.
Ⓥ Smith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.
Ⓥ South River Metal Products Co., South River, N. J.
Ⓥ Standard Pressed Steel Co., Jenkintown 10, Pa.
Ⓥ Stronghold Screw Products, Inc., 216-222 W. Hubbard St., Chicago 10, Ill.
Ⓥ United Screw & Bolt Corp., 2513 W. Fullerton St., Chicago 8, Ill.
Ⓥ Waterbury Jewel Co., Lancaster, Pa.
Waterloo Screw Co., 77 Rumford Ave., Waltham, Mass.
York Materials Co., Inc., P. O. Box 513, Jamaica, N. Y.

SCREWS—*Self Tapping*

Ⓥ Allendale Screw Products Co., Inc., 33 Screw St., New York 18, N. Y.
Ⓥ American Screw Co., Willimantic, Conn.
Bendix Radio Co., Inc., 145 Hudson St., New York, N. Y.
Ⓥ BLAKE & JOHNSON CO., Waterville 48, Conn. ADV. PG. 223.
Ⓥ Central Screw Co., 3501 Shields Ave., Chicago 9, Ill.
Ⓥ Continental Screw Co., New Bedford, Mass.
Ⓥ Curtis Screw Div., American Hardware Corp., High, Myrtle & Grove Sts., New Britain, Conn.
Ⓥ FEDERAL SCREW PRODUCTS INC., 224 W. Huron St., Chicago 10, Ill. ADV. PG. 271.
Ⓥ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
Ⓥ Harper Co., H. M., 8200 Lehigh Ave., Morton Grove, Ill.
Ⓥ INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
Ⓥ Lamson & Sessions Co., 1971 W. 85th St., Cleveland, Ohio.
Ⓥ Milford Rivet & Machine Co., Milford, Conn.
Ⓥ National Screw & Mfg. Co., The, Cleveland 4, Ohio.
Ⓥ Parker-Kalon Corp., 200 Varick St., New York 14, N. Y.
Ⓥ Pheoll Mfg. Co., 6700 Roosevelt Rd., Chicago 50, Ill.
Ⓥ Progressive Mfg. Co., 155 Chestnut St., Providence, R. I.
Ⓥ Shott Co., Walter L., 9306 Santa Monica Blvd., Beverly Hills, Calif.
Ⓥ Shurtleff Mfg. Co., Industrial Fastener Div., Waterbury, Conn.
Ⓥ Tinnerman Products, Inc., Div. of Illinois Tool Works, 2501 N. Keeler Ave., Chicago 39, Ill.
Ⓥ Smith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.
Ⓥ Washington Hardware Mfg. Co., Washington, Conn.
Ⓥ Stronghold Screw Products, Inc., 216-222 W. Hubbard St., Chicago 10, Ill.
Ⓥ United Screw & Bolt Corp., 2513 W. Fullerton St., Chicago 8, Ill.

SCREWS—*Set*

Ⓥ ALLEN MFG. CO., Hartford, Conn. ADV. PG. 85.
Ⓥ Allendale Screw Products, Inc., 33 Screw St., New York 18, N. Y.
Ⓥ American Lautscher Corp., 933 W. 52nd St., New York 19, N. Y.
Ⓥ Anthonow Co., 216-222 W. 18th St., New York 11, N. Y.
Bendix Radio Co., Inc., 145 Hudson St., New York, N. Y.
Ⓥ Bristol Co., The, Waterbury 20, Conn.
Ⓥ Central Screw Co., 3501 Shields Ave., Chicago 9, Ill.
Ⓥ Corbin Screw Div., American Hardware Corp., High, Myrtle & Grove Sts., New Britain, Conn.
Ⓥ FEDERAL SCREW PRODUCTS INC., 224 W. Huron St., Chicago 10, Ill. ADV. PG. 271.
Ⓥ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
Ⓥ Harper Co., H. M., 8200 Lehigh Ave., Morton Grove, Ill.
Ⓥ INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
Ⓥ Lamson & Sessions Co., 1971 W. 85th St., Cleveland, Ohio.
Ⓥ National Screw & Mfg. Co., The, Cleveland 4, Ohio.
Ⓥ Parker-Kalon Corp., 200 Varick St., New York 14, N. Y.
Ⓥ Pheoll Mfg. Co., 6700 Roosevelt Rd., Chicago 50, Ill.
Ⓥ Progressive Mfg. Co., 155 Chestnut St., Providence, R. I.
Ⓥ Shott Co., Walter L., 9306 Santa Monica Blvd., Beverly Hills, Calif.
Ⓥ Shurtleff Mfg. Co., Industrial Fastener Div., Waterbury, Conn.
Ⓥ Tinnerman Products, Inc., Div. of Illinois Tool Works, 2501 N. Keeler Ave., Chicago 39, Ill.
Ⓥ Smith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.
Ⓥ Washington Hardware Mfg. Co., Washington, Conn.
Ⓥ Stronghold Screw Products, Inc., 216-222 W. Hubbard St., Chicago 10, Ill.
Ⓥ United Screw & Bolt Corp., 2513 W. Fullerton St., Chicago 8, Ill.

Ⓥ HERMASEAL CO., INC., Riverside Drive, Elkhart, Ind. ADV. PG. 264.
Ⓥ HERMETIC SEAL PRODUCTS CO., 29-37 South 6th St., Newark, N. J. ADV. PG. 87.
Ⓥ Litton Industries, San Carlos, Calif.
Ⓥ MARION ELECTRICAL INSTRUMENT CO., Manchester, N. H. ADV. PG. 130.
Ⓥ Radiation Counter Laboratories, Inc., 1844 W. 21st St., Chicago 8, Ill.
Speer, Inc., Cincinnati 12, Ohio.
Ⓥ STUPAKOFF CERAMIC & MFG. CO., Latrobe, Pa. ADV. PG. 166, 167.
Ⓥ Varian Associates, 99 Washington St., San Carlos, Calif.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Ⓥ Wheaton Co., T. C., Industrial Div., 220 G St., Millville, N. J.
Ⓥ ZOPHAR MILLS, INC., 112-130 26th St., Brooklyn 32, N. Y. ADV. PG. 192.

SEALS—*Carbon*

Ⓥ Crane Packing Co., 1800 Cuyler Ave., Chicago 13, Ill.
Electro-Nite Carbon Co., 1133 E. Columbia Ave., Philadelphia 25, Pa.
Ⓥ GRAPHITE METALLIZING CORP., 1041 Nepperhan Ave., Yonkers 3, N. Y. ADV. PG. 76.
Ⓥ NATIONAL CARBON DIVISION, Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y. ADV. PG. 109.
Ⓥ Pure Carbon Co., St. Marys, Pa.
Ⓥ St. Marys Carbon Co., State Road, St. Marys, Pa.
Ⓥ Sealol Corp., 45 Willard Ave., Providence 5, R. I.
Ⓥ Speer Carbon Co., Lincoln Ave., St. Marys, Pa.
Ⓥ STACKPOLE CARBON CO., St. Marys, Pa. ADV. PG. 166, 167.
Ⓥ U. S. Graphite Co., Saginaw, Mich.

SEALS—*Hermetic*

Ⓥ AMERICAN TELEVISION & RADIO CO., 300 E. Fourth St., St. Paul 1, Minn. ADV. PG. 225.
Ⓥ CENTRALAB DIV. OF GLOBE UNION INC., 900 E. Keefe Ave., Milwaukee, Wis. ADV. PG. 64, 65.
Ⓥ CORNING GLASS WORKS, Corning, N. Y. ADV. PG. 234.
Dinkler, Inc., 1610 N. Main St., Elkhart, Ind.
Ⓥ ELECTRICAL INDUSTRIES, INC., 44 Summer Ave., Newark 4, N. J. ADV. PG. 217.
Electronic Mechanics Inc., 70 Clifton Blvd., Clifton, N. J.
Ⓥ ELECTRO-SEAL CORP., 946 Lee St., Des Plaines, Ill. ADV. PG. 90.
Ⓥ FEDERAL TELEPHONE AND RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.
Ⓥ Fast Products Mfg. Co., 1504 W. Carroll Ave., Chicago 7, Ill.
Ⓥ Fenite Corp., Carthage at Hannaford, Cincinnati 12, Ohio.
Ⓥ GENERAL CERAMICS & STEATITE CORP., Keasbey, N. J. ADV. PG. 219.
Ⓥ Heidor Bushing & Terminal Co., Inc., P. O. Box 91, Orange, N. J.
Ⓥ HERMETIC SEAL PRODUCTS CO., 29-37 South 6th St., Newark 7, N. J. ADV. PG. 264.
Ⓥ Radiation Counter Laboratories, Inc., 1844 W. 21st St., Chicago 8, Ill.
Speer, Inc., Cincinnati 12, Ohio.
Ⓥ STUPAKOFF CERAMIC & MFG. CO., Latrobe, Pa. ADV. PG. 166, 167.
Ⓥ Trial Transformer Mfg. Co., 2254 Sepulveda Blvd., Los Angeles 64, Calif.
Ⓥ Wheaton Co., T. C., Industrial Division, 220 G St., Millville, N. J.
Ⓥ ZOPHAR MILLS, INC., 112-130 26th St., Brooklyn 32, N. Y. ADV. PG. 192.

SEALS—*Metal to Glass*

Ⓥ Armstrong Cork Co., Lancaster, Pa.
Ⓥ CORNING GLASS WORKS, Corning, N. Y. ADV. PG. 234.
Ⓥ Distillation Products Industries, Vacuum Equipment Div., 755 Ridge Rd. W., Rochester 3, N. Y.
Dinkler, Inc., 1610 N. Main St., Elkhart, Ind.
Ⓥ ELECTRICAL INDUSTRIES, INC., 42 Summer Ave., Newark 4, N. J. ADV. PG. 217.
Ⓥ FEDERAL TELEPHONE & RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.
Ⓥ Fast Products Mfg. Co., 1504 W. Carroll Ave., Chicago 7, Ill.
Ⓥ Fenite Corp., Carthage at Hannaford, Cincinnati 12, Ohio.
Ⓥ HERMASEAL CO., INC., Riverside Drive, Elkhart, Ind. ADV. PG. 264.
Ⓥ HERMETIC SEAL PRODUCTS CO., 29-37 South 6th St., Newark, N. J. ADV. PG. 87.
Ⓥ Litton Industries, San Carlos, Calif.
Ⓥ MARION ELECTRICAL INSTRUMENT CO., Manchester, N. H. ADV. PG. 130.
Ⓥ Radiation Counter Laboratories, Inc., 1844 W. 21st St., Chicago 8, Ill.
Speer, Inc., Cincinnati 12, Ohio.
Ⓥ STUPAKOFF CERAMIC & MFG. CO., Latrobe, Pa. ADV. PG. 166, 167.
Ⓥ Varian Associates, 99 Washington St., San Carlos, Calif.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Ⓥ Wheaton Co., T. C., Industrial Div., 220 G St., Millville, N. J.
Ⓥ ZOPHAR MILLS, INC., 112-130 26th St., Brooklyn 32, N. Y. ADV. PG. 192.

SEALS—*Oil*

Ⓥ Armstrong Cork Co., Lancaster, Pa.
Ⓥ Crane Packing Co., 1800 Cuyler Ave., Chicago 13, Ill.
Eastern Metals Industries, 250 W. 54th St., New York 19, N. Y.
Ⓥ Fast Products Mfg. Co., 1504 W. Carroll Ave., Chicago 7, Ill.
Ⓥ Garlock Packing Co., Palmyra, N. Y.
Ⓥ General Tire & Rubber Co., The, Silentbloc Div., Wabash, Ind.
Ⓥ GRAPHITE METALLIZING CORP., 1041 Nepperhan Ave., Yonkers 3, N. Y. ADV. PG. 76.
Heidor Bushing & Terminal Co., Inc., P. O. Box 91, Orange, N. J.
Ⓥ Johns-Manville, 22 E. 40th St., New York 16, N. Y.
Ⓥ Sealol Corp., 45 Willard Ave., Providence 5, R. I.
Ⓥ U. S. Graphite Co., Saginaw, Mich.
Ⓥ ZOPHAR MILLS, INC., 112-130 26th St., Brooklyn 32, N. Y. ADV. PG. 192.

SELECTIVE CALLING APPARATUS

Ⓥ American Communications Corp., 30c Broadway, New York 7, N. Y.
Ⓥ Autocall Co., The, Shelby, Ohio.
Ⓥ Dennistle Radio, Inc., 7421 S. Loomis Blvd., Chicago 36, Ill.
Ⓥ Hammarlund Mfg. Co., 460 W. 34th St., New York 1, N. Y.
Ⓥ Intervox Corp., 2701 California Ave., Seattle 6, Wash.
Ⓥ Link Radio Corp., 125 W. 17th St., New York, N. Y.
Ⓥ Stevens-Arnold, Inc., 22 Elkins St., South Boston 27, Mass.

SERVOMECHANISMS

See Controls, Servo

SHAFTS

Ⓥ AEROLITE ELECTRONIC HARDWARE CORP., 507 24th St., Union City, N. J. ADV. PG. 138.
Ⓥ Citation Products Co., 233 E. 146th St., New York 51, N. Y.
Ⓥ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
Ⓥ Hammond Co., E. F., Waseca, Minn.
Ⓥ Keystone Electronics Co., 50-52 Franklin St., New York 13, N. Y.
Ⓥ National Screw & Mfg. Co., Cleveland 4, Ohio.
Ⓥ Pheo Mfg. Corp., 110 E. 42nd St., New York 17, N. Y.
Ⓥ Republic Steel Corp., Republic Bldg., Cleveland 1, Ohio.
Ⓥ Smith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.

SHAFTS—*Flexible*

Bendix Radio Co., Inc., 145 Hudson St., New York, N. Y.
Ⓥ BREEZE CORPNS., INC., 41 S. Sixth St., Newark 7, N. J. ADV. PG. 91.
Ⓥ Bud Radio, Inc., 2118 E. 55th St., Cleveland 3, Ohio.
Ⓥ Elliott Mfg. Co., 218 Prospect Ave., Binghamton, N. Y.
Ⓥ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
Ⓥ INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
Ⓥ Johnson Co., E. F., Waseca, Minn.
Ⓥ Kaufman Mfg. Co., 350 State St., Binghamton, N. Y.
Ⓥ Lear, Inc., 110 Iona Ave., N. W., Grand Rapids 2, Mich.
Ⓥ STEWART MFG. CORP., F. W., 6311 Ravenswood Ave., Chicago 13, Ill. ADV. PG. 104.
Ⓥ Stow Mfg. Co., 445 State St., Binghamton, N. Y.
Ⓥ White Dental Mfg. Co., S. S., Industrial Div., 10 E. 40th St., New York, N. Y.

SHAPERS—*Television Signal*

Telequip Radio Co., 1901 S. Washtenaw, Chicago, Ill.

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

SHIELDING—*Electrostatic*

Acheson Colloids Corp., Port Huron, Mich.
Ⓥ CINCH MFG. CORP., 1026 S. Homan Ave., Chicago 24, Ill. ADV. PG. 154.
Ⓥ Elliott Mfg. Co., 218 Prospect Ave., Binghamton, N. Y.
Kupfrian Mfg. Co., 350 State St., Binghamton, N. Y.
Ⓥ Metal Textile Corp., 647 E. First Ave., Roselle, N. J.
Ⓥ Stalkraft Co., The, 205 W. Wacker Drive, Chicago 6, Ill.
Ⓥ Uniform Tubes, Shurs Lane & Larkiston St., Roxborough, Philadelphia, Pa.

SHIELDING—*Radio Ignition*

Birnbach Radio Co., Inc., 145 Hudson St., New York, N. Y.
Ⓥ BOSTON INSULATED WIRE & CABLE CO., 63 Bay St., Boston 27, Mass. ADV. PG. 157.
Ⓥ BREEZE CORPS. INC., 41 S. Sixth St., Newark 7, N. J. ADV. PG. 93.
Ⓥ Consolidated Wire & Associated Companies, 1638 S. Clinton St., Chicago 16, Ill.
Ⓥ Elliott Mfg. Co., 218 Prospect Ave., Binghamton, N. Y.
Filtron Co., Inc., The, 38-25 Bell Blvd., Bayside, L. I., N. Y.
Ⓥ Flexo Wire Co., Inc., 70 W. First St., Oswego, N. Y.
Ⓥ Hallett Mfg. Co., 1601 Florence Ave., Inglewood, Calif.
Ⓥ Kupfrian Mfg. Co., 350 State St., Binghamton, N. Y.
Ⓥ Metal Textile Corp., 647 E. First Ave., Roselle, N. J.
Ⓥ New England Electrical Works, Lisbon, N. H.
Ⓥ Uniform Tubes, Shurs Lane and Lansdale St., Roxborough, Philadelphia, Pa.

SHIELDING—*Sheet or Screen*

Ⓥ Metal Textile Corp., 647 E. First Ave., Roselle, N. J.
Ⓥ Stalkraft Co., The, 205 W. Wacker Drive, Chicago 6, Ill.

SHIELDS—*Cathode Ray Tube*

Ⓥ Cossor (Canada) Ltd., 301-303 Windsor St., Halifax, N. S., Canada.
Ⓥ ELECTRONIC TUBE CORP., 1200 E. Mermaid Lane, Philadelphia 18, Pa. ADV. PG. 156.
Ⓥ Magnetic Metals Co., Hayes Ave. at 21st St., Camden, N. J.
Magnetics, Inc., P. O. Box 761, Butler, Pa.
Ⓥ Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.
Ⓥ MULTI METAL WIRE CLOTH CO., INC., 1360 Garrison Ave., New York 59, N. Y. ADV. PG. 66.
Ⓥ WATERMAN PRODUCTS CO., INC., 2445-63 Emerald St., Philadelphia 25, Pa. ADV. PG. 252.

SHIELDS—*Coil*

Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ Hallett Mfg. Co., 1601 Florence Ave., Inglewood, Calif.
Ⓥ INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
Ⓥ KOBZY TOOL CO., 1535 N. Dayton Ave., Chicago 22, Ill. ADV. PG. 165.
Ⓥ Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.
Ⓥ Miller Co., J. W., 5917 S. Main St., Los Angeles, Calif.
Ⓥ Paul & Beekman Inc., 1801 Cortland St., Philadelphia 40, Pa.
Ⓥ Worcester Pressed Aluminum Corp., 13-15 Hope Avenue, Worcester 3, Mass.

SHIELDS—*Lead*

Ⓥ Anchor Metal Co., 87 Walker St., New York 13, N. Y.
Ⓥ ATOMIC INSTRUMENT CO., 160 Charles St., Boston, Mass. ADV. PG. 218.
Birnbach Radio Co., Inc., 145 Hudson St., New York, N. Y.
Ⓥ Chicago Expansion Bolt Co., 1338 Concord Pl., Chicago 22, Ill.
Ⓥ Hallett Mfg. Co., 1601 Florence Ave., Inglewood, Calif.
Ⓥ Oscar Expansion Products Co., 147-149 Cedar St., New York 6, N. Y.
Ⓥ Technical Associates, 3730 San Fernando Rd., Glendale 4, Calif.
Ⓥ Vitamite Co., 227 W. 46th St., New York 23, N. Y.

SHIELDS—*Transformer*

Eastern Metals Industries, 250 W. 54th St., New York 19, N. Y.
Ⓥ Industrial Precision Products Co., 315-325 N. Hoyne Ave., Chicago 12, Ill.
Kling Metal Spinning Co., 174 Centre St., New York 13, N. Y.
Ⓥ Magnetic Metals Co., Hayes Ave., & 21st St., Camden, N. J.
Magnetics, Inc., P. O. Box 761, Butler, Pa.
Ⓥ Thordarson Electric Mfg. Div., Maguire Industries, Inc., 500 W. Huron St., Chicago 10, Ill.
Ⓥ Triad Transformer Mfg. Co., 2254 Sepulveda Blvd., Los Angeles 64, Calif.
Ⓥ Worcester Pressed Aluminum Corp., 13-15 Hope Avenue, Worcester 3, Mass.

SHIELDS—*Tube*

Ⓥ ALDEN PRODUCTS CO., 117 N. Main St., Brockton 64, Mass. ADV. PG. 235.
Ⓥ ATOMIC INSTRUMENT CO., 160 Charles St., Boston, Mass. ADV. PG. 218.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ CINCH MFG. CORP., 1026 S. Homan Ave., Chicago 24, Ill. ADV. PG. 154.
Eby, Inc., Hugh H., 4700 Stenton Ave., Phila. 44, Pa.
Ⓥ Elco Mfg. Co., Div. of Electro-Connector Corp., 110 W. Oxford St., Phila. 22, Pa.
Ⓥ Franklin Mfg. Corp., A. W., 43-20 34th St., Long Island City, N. Y.
Ⓥ Gout Co., Inc., Fred, 314 Dean St., Brooklyn, N. Y.
Ⓥ Industrial Precision Products Co., 315-325 N. Hoyne Ave., Chicago 12, Ill.
Ⓥ INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246-247.
Ⓥ J F D MFG. CO., 6101-23 Sixteenth Ave., Brooklyn, N. Y. ADV. PG. 254, 264.
Ⓥ Johnson Co., E. F., Waseca, Minn.
Ⓥ Methode Mfg. Corp., 1733 N. Milwaukee Ave., Chicago 47, Ill.
Ⓥ Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.
Ⓥ Production Engineering Co., 173 Sargeant Ave., Clifton, N. J.
Ⓥ Smith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.
Ⓥ STAVER CO., INC., 91 Pearl St., Brooklyn 1, N. Y. ADV. PG. 180.
Ⓥ Worcester Pressed Aluminum Corp., 13-15 Hope Avenue, Worcester 3, Mass.

SHIFTER—*Signal*

Ⓥ Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.

SHUNTS—*Meter*

Ⓥ Associated Research, Inc., 3758 W. Belmont, Chicago 18, Ill.
Bradshaw Instruments Co., 348 Livingston St., Brooklyn 17, N. Y.
Ⓥ Citation Products Co., 233 E. 146th St., New York 51, N. Y.
Ⓥ CLAROSTAT MFG. CO., INC., Dover, N. H. ADV. PG. 227.
Ⓥ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ Esterline-Angus Co., Inc., P. O. Box 596, Indianapolis 6, Ind.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ INSTRUMENT RESISTORS CO., 1836 Commerce Ave., Union, N. J. ADV. PG. 174, 175.
Ⓥ MARION ELECTRICAL INSTRUMENT CO., Manchester, N. H. ADV. Pg. 130.
Ⓥ Meters, Inc., 915 Westfield Blvd., Indianapolis 20, Ind.
Ⓥ Precision Resistor Co., 334 Badger Ave., Newark 8, N. J.
Ⓥ Roller-Smith, Bethlehem, Pa.
Ⓥ Sensitive Research Instrument Corp., 9 Elm Ave., Mt. Vernon, N. Y.
Ⓥ SHALLCROSS MFG. CO., 10 Jackson Ave., Collingdale, Pa. ADV. PG. 221.
Ⓥ Simpson Electric Co., Div. American Gage & Machine Co., 5200 W. Kinzie Street, Chicago 44, Ill.
Ⓥ Triplett Electric Instrument Co., 286 Harmon Road, Bluffton, Ohio.
Ⓥ Welch Scientific Co., W. M., 1515 Sedgwick St., Chicago 10, Ill.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

SIGNAL SHIFTER

See Shifter, Signal

SILICON

See Metals

SILICONE—*Compounds*

See Insulating Compounds

SLEEVES—*Antenna Copper Splicing*

Ⓥ Copperweld Steel Co., Glassport, Pa.
Ⓥ Locke Incorporated, P. O. Box 57, Baltimore 3, Md.
Ⓥ Sherman Mfg. Co., H. B., 22 Barney St., Battle Creek, Mich.

SOCKETS—*Battery*

Ⓥ ALDEN PRODUCTS CO., 117 No. Main St., Brockton 64, Mass. ADV. PG. 235.
Ⓥ CINCH MFG. CORP., 1026 S. Homan Ave., Chicago 24, Ill. ADV. PG. 154.
Eby, Inc., Hugh H., 4700 Stenton Ave., Philadelphia 44, Pa.
Ⓥ Elco Mfg. Co. Div. of Electro-Connector Corp., 110 W. Oxford Ave., Phila. 22, Pa.
Ⓥ Franklin Mfg. Corp., A. W., 43-20 34th St., Long Island City, N. Y.
Ⓥ J F D MFG. CO., 6101-23 Sixteenth Ave., Brooklyn, N. Y. ADV. PG. 254, 264.
Ⓥ MYCALEX TUBE SOCKET CORP., 60 Clifton Blvd., Clifton, N. J. ADV. PG. 161.

SOCKETS—*Crystal*

Ⓥ CINCH MFG. CORP., 1026 S. Homan Ave., Chicago 24, Ill. ADV. PG. 154.
Eby, Inc., Hugh H., 4700 Stenton Ave., Philadelphia 44, Pa.
Ⓥ Franklin Mfg. Corp., A. W., 43-20 34th St., Long Island City, N. Y.
Ⓥ Isolantite Mfg. Corp., Stirling, N. J.
Ⓥ Johnson Co., E. F., Waseca, Minn.
Ⓥ Keystone Electronics Co., 50-52 Franklin St., New York 13, N. Y.
Ⓥ Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.
Ⓥ Molded Insulation Co., Aircraft Control Div., 335 E. Price St., Philadelphia, Pa.
Ⓥ MYCALEX TUBE SOCKET CORP., 60 Clifton Blvd., Clifton, N. J. ADV. PG. 161.
Ⓥ NATIONAL CO., INC., 61 Sherman St., Malden 48, Mass. ADV. PG. 33 to 36.
Westline Electronics Co., 11660 Olympic Blvd., Los Angeles 25, Calif.

SOCKETS—*Dial and Pilot Light*

Ⓥ AEROLITE ELECTRONIC HARDWARE CORP., 507 26th St., Union City, N. J. ADV. PG. 138.
Ⓥ ALDEN PRODUCTS CO., 117 No. Main St., Brockton 64, Mass. ADV. PG. 235.
Ⓥ DIAL LIGHT COMPANY OF AMERICA, INC., 900 Broadway, New York 3, N. Y. ADV. PG. 50.
Ⓥ Drake Mfg. Co., 1713 Hubbard St., Chicago, Ill.
Ⓥ FEDERAL SCREW PRODUCTS INC., 224 W. Huron St., Chicago 10, Ill. ADV. PG. 271.
Ⓥ Franklin Mfg. Corp., A. W., 43-20 34th St., Long Island City, N. Y.
Ⓥ Johnson Co., E. F., Waseca, Minn.
Ⓥ Kurka Electric Mfg. Co., Inc., 30 South St., Mt. Vernon, N. Y.
Ⓥ Marco Industries Co., 210 S. Clementine, Anaheim, Calif.
Micarta Fabricators, Inc., 5324 Ravenswood Ave., Chicago 40, Ill.
Ⓥ Molded Insulation Co., Aircraft Control Div., 335 E. Price St., Philadelphia, Pa.
Ⓥ Morse Co., Frank W., 1300 Soldiers Rd., Boston 35, Mass.
Ⓥ MYCALEX TUBE SOCKET CORP., 60 Clifton Blvd., Clifton, N. J. ADV. PG. 161.
Ⓥ Ucinite Co., Div. of United-Carr Fastener Corp., 459 Watertown St., Newtonville, Mass.
Ⓥ Wade Electric Products Co., 211 Jacob St., Sturgis, Mich.

SOCKETS—*Microwave Tube*

Ⓥ AMERICAN PHENOLIC CORPORATION, 1830 S. 54th Ave., Chicago 54, Ill. ADV. PG. 191.
Ⓥ CINCH MFG. CORP., 1026 S. Homan Ave., Chicago 24, Ill. ADV. PG. 154.
Ⓥ Microwave Equipment Co., Inc., North Caldwell, N. J.
Ⓥ MYCALEX TUBE SOCKET CORP., 60 Clifton Blvd., Clifton, N. J. ADV. PG. 161.
Ⓥ RAYTHEON MFG. CO., Power Tube Div., Waltham 54, Mass. ADV. PG. 257.
Selector Industries, Inc., 401 E. 138th St., New York 54, N. Y.

SOCKETS—*Miniature Sockets & Connectors*

Ⓥ ALDEN PRODUCTS CO., 117 No. Main St., Brockton 64, Mass. ADV. PG. 235.
Ⓥ AMERICAN PHENOLIC CORPORATION, 1830 S. 54th Ave., Chicago 50, Ill. ADV. PG. 191.
Ⓥ CENTRALAB DIV. OF GLOBE UNION INC., 900 E. Keefe Ave., Milwaukee, Wis. ADV. PG. 64, 65.
Ⓥ CINCH MFG. CORP., 1026 S. Homan Ave., Chicago 24, Ill. ADV. PG. 154.
Cole-Hersee Co., 20 Old Colony Ave., Boston 27, Mass.
Ⓥ DIAL LIGHT CO. OF AMERICA, 900 Broadway, New York 3, N. Y. ADV. PG. 50.
Eagle Electric Mfg. Co., Inc., 23-10 Bridge Plaza S., Long Island City, N. Y.
Ⓥ Elco Mfg. Co. Div. of Electro-Connector Corp., 110 W. Oxford St., Phila. 22, Pa.
Ⓥ Franklin Mfg. Corp., A. W., 43-20 34th St., Long Island City, N. Y.
Ⓥ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.

✓ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

✓Hill & Sons Inc., 79 Third St., Brooklyn 31, N. Y.
✓Hollett Mfg. Co., 1601 Florence Ave., Inglewood, Calif.
✓INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
✓Johnson Co., E. F., Waseca, Minn.
✓JONES DIV., HOWARD B., CINCH MFG. CORP., 1026 S. Homan Ave., Chicago 24, Ill. ADV. PG. 155.
✓Methode Mfg. Corp., 1733 N. Milwaukee Ave., Chicago 47, Ill.
✓Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.
✓Morse Co., Frank W., 1100 Soldiers Rd., Boston 35, Mass.
✓MYCALEX TUBE SOCKET CORP., 66 Clifton Blvd., Clifton, N. J. ADV. PG. 161.
✓NATIONAL CO., INC., 61 Sherman St., Malden 48, Mass. ADV. PG. 33 to 36.
✓Penrose Co., Inc., 2101 Bryant St., San Francisco, Calif.
Selectric Industries, Inc., 401 E. 134th St., New York 54, N. Y.
✓Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
✓Victor Electronics Co., 1154 Riverside Drive, Los Angeles 31, Calif.

SOCKETS—*Tube*

✓ALDEN PRODUCTS CO., 117 No. Main St., Brockton 64, Mass. ADV. PG. 230.
✓AMERICAN PHENOLIC CORPORATION, 1830 S. 54th Ave., Chicago 50, Ill. ADV. PG. 191.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
✓CENTRALAB DIV. OF GLOBE UNION INC., 900 E. Keefe Ave., Milwaukee 1, Wis. ADV. PG. 64, 65.
✓CINCH MFG. CORP., 1026 S. Homan Ave., Chicago 24, Ill. ADV. PG. 154.
Eby, Inc., Hugh H., 4700 Stenton Ave., Philadelphia 44, Pa.
✓Elet-McCullough, Ind., San Bruno, California.
✓Elco Mfg. Co. Div. of Electro-Connector Corp., 110 W. Oxford St., Phila. 22, Pa.
✓FEDERAL SCREW PRODUCTS INC., 224 W. Huron St., Chicago 10, Ill. ADV. PG. 271.
✓Franklin Mfg. Corp., A. W., 43-28 34th St., Long Island City, N. Y.
✓GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
✓GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 16.
✓INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
✓Jeanrette Mfg. Corp., Sterling, N. J.
✓J. F. D. MFG. CO., 6101 24 Sixteenth Ave., Brooklyn, N. Y. ADV. PG. 254, 264.
✓Johnson Co., E. F., Waseca, Minn.
✓Methode Mfg. Corp., 1733 N. Milwaukee Ave., Chicago 47, Ill.
✓Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.
✓Mycalex Insulation Co., Aircraft Control Div., 335 E. Price St., Philadelphia, Pa.
✓MYCALEX TUBE SOCKET CORP., 66 Clifton Blvd., Clifton, N. J. ADV. PG. 161.
✓NATIONAL CO., INC., 61 Sherman St., Malden 48, Mass. ADV. PG. 33 to 36.
✓Network Mfg. Corp., Bayside, N. Y.
✓Polarad Mfg. Co., 134 University Place, New York 3, N. Y.
✓Penrose Co., 2101 Bryant St., San Francisco 10, Calif.
✓Tinnerman Co. Inc., Div. of United-Carr Fastener Corp., 459 Watertown St., Newtonville, Mass.
✓Victor Electronics Co., 1154 Riverside Drive, Los Angeles 31, Calif.

SOLDER

✓Aluminum Co. of America, Gulf Bldg., Pittsburgh, Pa.
✓Alpha Metals, Inc., 363 Hudson Ave., Brooklyn 1, N. Y.
✓Anchor Metal Co., 87 Walker St., New York 13, N. Y.
Arch Mfg. Corp., 250 Lafayette Ave., Newark 4, N. J.
✓Baker & Co., Inc., 113 Astor St., Newark 5, N. J.
✓Chase Brass & Copper Co., Inc., Waterbury 91, Conn.
Eutectic Welding Alloys Corp., 40 Worth St., New York 13, N. Y.
✓Federated Metals Div., American Smelting & Refining Co., 120 Broadway, New York 5, N. Y.
✓Gardner & Harman, 82 Fulton St., New York 7, N. Y.
✓Handy & Harman, 82 Fulton St., New York 7, N. Y.
✓Hoover & Co., Inc., 114 Astor St., Newark 5, N. J.
✓Johnson & Co., Inc., 114 Astor St., Newark 5, N. J.
✓Kester Solder Co., 4212 Wrightwood Ave., Chicago 39, Ill. ADV. PG. 267.
✓Lead Industries Assn., 420 Lexington Ave., New York 17, N. Y.
✓Lewis & Co., John F., 30 Cunnington St., Boston 15, Mass.
✓Lucas Mfg. Co., 30 Huntington St., Boston 19, Mass.
✓MAKEPEACE CO., D. E., Attleboro, Mass. ADV. PG. 97.
✓Multicore Sales Corp., 164 Duane St., New York 13, N. Y. ADV. PG. 21.
✓National Lead Co., 111 Broadway, New York 6, N. Y.
✓New York Solder Co., 684 E. 133rd St., New York 54, N. Y.
✓Pitt Chemical Co., 68 McDowell St., Columbus 1, Ohio.
✓Pierson & Son, Inc., J. T., Box 8000-A, Chicago, Ill.
✓Soldering Specialties Co., Summit, N. J.
✓Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
✓Super Flow Solder Co., Inc., 90 State St., Albany, N. Y.
✓WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

SOLDER—*Aluminum*

✓Division Lead Co., 816 W. Kinzie St., Chicago 22, Ill.
Eutectic Welding Alloys Corp., 40 Worth St., New York 13, N. Y.
✓Federated Metals Div., American Smelting & Refining Co., 120 Broadway, New York 5, N. Y.
✓Lucas Mfg. Co., 30 Huntington St., Boston 19, Mass.
✓Metallurgical Products Co., Mount Vernon, Iowa.
✓KESTER SOLDER CO., 4212 Wrightwood Ave., Chicago 39, Ill. ADV. PG. 267.
✓Tinn Mfg. Co., 30 Cunnington St., Boston 15, Mass.
✓Soldering Specialties Co., Summit, N. J.

SOLDER—*Platinum*

✓AMERICAN PLATINUM WORKS, N. J. R. R. Ave. at Oliver St., Newark 5, N. J. ADV. PG. 265.
✓Baker & Co., Inc., 113 Astor St., Newark 5, N. J.
✓COHN CORP., SIGMUND, 44 Gold St., New York 38, N. Y. ADV. PG. 176.
✓Division Lead Co., 816 W. Kinzie St., Chicago 22, Ill.
✓Handy & Harman, 82 Fulton St., New York 7, N. Y.
✓NEY CO., J. M., 179 Elm St., Hartford, Conn. ADV. PG. 142.
✓Wollberg Bros. Smelting & Refining Co., 742 Market St., San Francisco 2, Calif.

SOLDER—*Rings and Preforms*

✓Alpha Metals, Inc., 363 Hudson Ave., Brooklyn 1, N. Y.
✓AMERICAN PLATINUM WORKS, N. J. R. R. Ave. at Oliver St., Newark 5, N. J. ADV. PG. 265.
✓Anchor Metal Co., 87 Walker St., New York 13, N. Y.
✓Division Lead Co., 816 W. Kinzie St., Chicago 22, Ill.
✓Eastern Smelting & Refining Corp., 107-109 W. Broadway St., Boston 18, Mass.
Eutectic Welding Alloys Corp., 40 Worth St., New York 13, N. Y.
✓GLASER LEAD CO., INC., 31 Wyckoff Ave., Brooklyn, N. Y. ADV. PG. 251.
✓Handy & Harman, 82 Fulton St., New York 7, N. Y.
✓KESTER SOLDER CO., 4212 Wrightwood Ave., Chicago 39, Ill. ADV. PG. 267.
✓Kong & Co., Charles W., 52 Dickerson St., Newark, N. J.
✓MAKEPEACE CO., D. E., Attleboro, Mass. ADV. PG. 97.
✓MULTICORE SALES CORP., 164 Duane St., New York 13, N. Y. ADV. PG. 21.
✓National Lead Co., 111 Broadway, New York 6, N. Y.
✓NEY CO., J. M., 179 Elm St., Hartford, Conn. ADV. PG. 142.
✓Soldering Specialties Co., Summit, N. J.

SOLDER—*Silver*

✓AMERICAN PLATINUM WORKS, N. J. R. R. Ave. at Oliver St., Newark 5, N. J. ADV. PG. 265.
✓Anchor Metal Co., 87 Walker St., New York 13, N. Y.
✓Baker & Co., Inc., 113 Astor St., Newark 5, N. J.
✓Chase Brass & Copper Co., Inc., Waterbury 91, Conn.
✓Division Lead Co., 816 W. Kinzie St., Chicago 22, Ill.
Eastern Metals Industries, 250 W. 54th St., New York 19, N. Y.
✓Eastern Smelting & Refining Corp., 107-109 W. Broadway St., Boston 18, Mass.
Eutectic Welding Alloys Corp., 40 Worth St., New York 13, N. Y.
✓Federated Metals Div., American Smelting & Refining Co., 120 Broadway, New York 5, N. Y.
✓GENERAL PLATE DIVISION, Metals & Controls Corp., Attleboro, Mass. ADV. PG. 268.
✓Gardner & Harman, 82 Fulton St., New York 7, N. Y.
✓MAKEPEACE CO., D. E., Attleboro, Mass. ADV. PG. 97.
✓NEY CO., J. M., 179 Elm St., Hartford, Conn. ADV. PG. 142.
✓Soldering Specialties Co., Summit, N. J.
✓Wollberg Bros. Smelting & Refining Co., 742 Market St., San Francisco 2, Calif.

SOLDERING GUNS

See Tools, Soldering Guns

SOLDERING IRONS—*Electric*

See Irons, Electric Soldering

SOLENOIDS

✓A. P. W. Co., 72 W. Main St., Rockaway, N. J.
Ace Precision Products Corp., 10777 Van Owen St., Burbank, Calif.
✓Aurex Corp., 1117 N. Franklin St., Chicago, Ill.
✓Automatic Electric Sales Corp., 1033 W. Van Buren St., Chicago 7, Ill.
Bittermann Electric Co., Box 665, Canaan, Conn.
✓BOND ELECTRONICS CORP., 88 Franklin Place, Summit, N. J. ADV. PG. 255.
✓Cannon Electric Development Co., 3209 Humboldt St., Los Angeles 31, Calif.
✓Connecticut Telephone & Electric Div., Great American Industries, Inc., 70 Britannia St., Meriden, Conn.
✓Davis & Co., Dean W., Kentland, Ind.
✓EASTERN AIR DEVICES, INC., 585 Dean St., Brooklyn 17, N. Y. ADV. PG. 258.
Electric Aire, Inc., 11419 Vanowen St., North Hollywood, Calif.
✓General Controls Co., Glendale 1, Calif.
✓GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 16.
✓GUARDIAN ELECTRIC MFG. CO., 1621 W. Walnut St., Chicago 12, Ill. ADV. PG. 31.
✓Hercules Electric & Mfg. Co., Inc., 2500 Atlantic Ave., Brooklyn 7, N. Y.
✓HOULIHAN CO., T. J., 2508-14 W. Lawrence St., Chicago 25, Ill. ADV. PG. 276.
✓Industry Norris Mfg. Co., 2320 Marconi Ave., St. Louis 20, Mo.
✓Magnavox Co., The, Components Div., Fort Wayne 4, Indiana.
Monroe Coil Co., 2839 N. Narragansett Ave., Chicago 34, Ill.
✓National Acme Co., 170 E. 131st St., Cleveland 8, Ohio.
Peerless Electrical Products Co., 6920 McKinley Ave., Los Angeles 1, Calif.
✓PHILLIPS CONTROL CORP., 84 W. Jefferson St., Joliet, Ill. ADV. PG. 230.
✓R. E. M. Div. Essex Wire Corp., Logansport, Ind.
✓RADIO CORES, INC., 3640 Tully Ave., Oak Lawn, Ill. ADV. PG. 260.
✓Roebling's Sons Co., John A., 640 Broad St., Trenton 7, N. J.
Sonotone Mfg. Co., Nathan R., 105 Pasadena Ave., S. Pasadena, Calif.
✓STANDARD COIL PRODUCTS CO., 2329 N. Pulaski Rd., Chicago 39, Ill. ADV. PG. 233.
✓Standard Electrical Products Co., 402 E. 1st St., Dayton, Ohio.
✓Wheeler Insulated Wire Co., Inc., 150 E. Aurora St., Waterbury 91, Conn.

SOLENOIDS—*Rotary*

✓Davis & Co., Dean W., Kentland, Ind.
✓GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 16.
✓LELAND INC., G. H., 125 Webster St., Dayton 2, Ohio. ADV. PG. 246, 247.

SONIC LOCATING EQUIPMENT

✓Bacon Electric Co., 52 E. 19th St., New York 3, N. Y.
✓RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
✓Triplett & Barton, Inc., 931 N. Lake St., Burbank, Calif.

SORTERS—*Electronic*

See Controls—Counting & Sorting

SOUND SYSTEMS—*Complete*

✓Allied Radio Corp., 833 W. Jackson Blvd., Chicago 7, Ill.
✓Altec Lansing Corp., 161 Avenue of the Americas, New York 13, N. Y.
✓American Communications Corp., 306 Broadway, New York, N. Y.
✓BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 269.
Arlington Electric Products, Inc., 500 W. 52nd St., New York 19, N. Y.
✓Bell Sound Systems, Inc., 555 Marion Rd., Columbus 7, Ohio.
✓Boom Electric & Amplifier Co., 1227 W. Washington Blvd., Chicago 7, Ill.
✓Commercial Radio Sound Corp., 525 Lexington Ave., New York 17, N. Y.
✓Farnsworth & Son, Inc., C. D., 460-64 Avenue of the Americas, New York 11, N. Y.
✓Dukes Co., The, Seymour, Conn.
✓Executone, Inc., 415 Lexington Ave., New York 17, N. Y.
✓Live Distance Mechanisms, 17-61 69th St., Jackson Heights L. I., N. Y.
✓Porter Radio Co., Quincy, Ill.
✓Turner Electric Mfg. Co., 2 Linden St., Reading, Mass.
✓National Intercommunicating Systems, 1561 Devon Ave., Chicago 26, Ill.

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

Ⓥ Connecticut Mfg. Co., 135th & Indiana Sts., St. Charles, Ill.

Ⓥ Precision Electronics, 641 Milwaukee Ave., Chicago 22.

Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 75. Inside Back and Back Covers.

Radio Mirror Corp., Port Chester, N. Y.

Ⓥ Raytheon Mfg. Corp., 3523 W. Addison St., Chicago 18, Ill.

Riggs & Jeffreys, Inc., 140 Glenridge Ave., Montclair, N. J.

Schlumberger Electronics, Inc., Sellersville, Pa.

Seeburg Corp., J. P., 1500 N. Dayton Ave., Chicago 22, Ill.

Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.

Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W.C. 2, England.

Stephens Mfg. Corp., 8538 Warner Drive, Culver City, Calif.

Western Sound & Electric Labs., Inc., 805 S. 5th St., Milwaukee 4, Wis.

SOURCES—*Alpha Ray*

Ⓥ Canadian Radium & Uranium Corp., 630 Fifth Ave., New York 20, N. Y.

Ⓥ Technical Associates, 3730 San Fernando Rd., Glendale 4, Calif.

Ⓥ U. S. Radium Corp., 535 Pearl St., New York 7, N. Y.

SPEAKERS

See Loudspeakers

SPECTROMETERS—*Mass*

Ⓥ Consolidated Engineering Corp., 620 N. Lake Ave., Pasadena 6, Calif.

Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.

Ⓥ Manufacturers Engr. & Equip. Corp., Willow Grove, Pa. Process & Instruments, 60 Greenpoint Ave., Brooklyn 22, N. Y.

Ⓥ Vacuum Electronic Engineering Co., 314 37th St., Brooklyn 2, N. Y.

SPECTROMETERS and SPECTOGRAPHS

Ⓥ Applied Research Laboratories, 4336 San Fernando Rd., Glendale 4, Calif.

Ⓥ Baird Associates, Inc., 33 University Rd., Cambridge 38, Mass.

Ⓥ Bausch & Lomb Optical Co., 635 St. Paul St., Rochester 2, N. Y.

Ⓥ Central Scientific Co., 1700 Irving Park Rd., Chicago 13, Ill.

Ⓥ Farrand Optical Co., Inc., Bronx Blvd. at 238th St., New York 66, N. Y.

Ⓥ Gaertner Scientific Corp., 1201 Wrightwood Ave., Chicago 14, Ill.

Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.

Harshaw Scientific Div. of The Harshaw Chemical Co., 1945 E. 97th St., Cleveland 6, Ohio.

Ⓥ Jarrell-Ash Co., 165 Newbury St., Boston 16, Mass.

Ⓥ North American Phillips Co., Inc., 100 E. 42nd St., New York 17, N. Y.

Ⓥ Perkin-Elmer Corp., The, Glenbrook, Conn.

Ⓥ Varian Associates, 99 Washington St., San Carlos, Calif.

Ⓥ Welsh Scientific Co., W. M., 1515 Sedgwick St., Chicago 10, Ill.

SPECTROPHOTOMETERS

Ⓥ Applied Physics Corp., 30 W. Green St., Pasadena 1, Calif.

Ⓥ Baird Associates, Inc., 33 University Rd., Cambridge 38, Mass.

Ⓥ Bausch & Lomb Optical Co., 635 St. Paul St., Rochester 2, N. Y.

Ⓥ Central Scientific Co., 1700 Irving Park Rd., Chicago 13, Ill.

Ⓥ Coleman Instruments, Inc., 318 Madison St., Maywood, Ill.

Ⓥ Farrand Optical Co., Inc., Bronx Blvd. at 238th St., New York 66, N. Y.

Ⓥ Gaertner Scientific Corp., 1201 Wrightwood Ave., Chicago 14, Ill.

Ⓥ Gardner Lab., Inc., Henry A., 4723 Elm St., Bethesda 14, Md.

Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.

Harshaw Scientific Div. of The Harshaw Chemical Co., 1945 E. 97th St., Cleveland 6, Ohio.

Ⓥ Jarrell-Ash Co., 165 Newbury St., Boston 16, Mass.

Ⓥ Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.

Ⓥ National Technical Laboratories, 820 Mission St., South Pasadena, Calif.

Ⓥ Perkin-Elmer Corp., The, Glenbrook, Conn.

Photovolt Corp., 95 Madison Ave., New York 16, N. Y.

Ⓥ Thompson & Associates, John E., 7210 S. Yates Ave., Chicago 49, Ill.

SPECTROSCOPIC SOURCE UNITS

Ⓥ Applied Research Labs., 4336 San Fernando Rd., Glendale 4, Calif.

Ⓥ Baird Associates, Inc., 33 University Ave., Cambridge 38, Mass.

Ⓥ Bausch & Lomb Optical Co., 635 St. Paul St., Rochester 2, N. Y.

Ⓥ Jarrell-Ash Co., 165 Newberry St., Boston 16, Mass.

Ⓥ National Spectrographic Laboratories, Inc., 6300 Euclid Ave., Cleveland 3, Ohio.

SPEEDOMETERS—*Electric*

Ⓥ AMERICAN CHRONOSCOPE CORP., 316 W. First St., Mt. Vernon, N. Y. ADV. PG. 84.

Ⓥ C. G. S. LABORATORIES, INC., 36 Ludlow St., Stamford, Conn. ADV. PG. 244.

Ⓥ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.

Electric Tachometer Corp., 2218 Vine St., Philadelphia 3, Pa.

Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.

Ⓥ Westberg Mfg. Co., 612 N. Michigan Ave., Chicago 11, Ill.

SPRINGS

Accurate Spring Mfg. Co., 3811 W. Lake St., Chicago, Ill.

Ⓥ Ace Spring Mfg. Co., 77 W. Houston St., New York 12, N. Y.

All Weather Springs, 140 Cedar St., New York 6, N. Y.

Ⓥ Barnes-Gibson-Raymond Div. of Associated Spring Corp., 6400 Miller Ave., Detroit 11, Mich.

Ⓥ Cuyahoga Spring Co., 10272 Berea Rd., Cleveland, Ohio.

Ⓥ Dzus Fastener Co., Inc., Box 785, Babylon, N. Y.

Ⓥ Garrett Co., Inc., George K., D & Tioga Sts., Philadelphia 34, Pa.

Ⓥ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.

Ⓥ Hubbard Spring Co., M. D., Central Ave., Pontiac, Mich.

Ⓥ Hunter Spring Co., Lansdale, Pa.

Ⓥ INSTRUMENT SPECIALTIES CO. INC., 254 Bergen Blvd., Little Falls, N. J. ADV. PG. 202.

Ⓥ Jones Spring Co., W. B., 124 E. 7th St., Cincinnati, Ohio.

Ⓥ Peck Spring Co., 9 King St., Plainville, Conn.

Ⓥ Raymond Mfg. Co., Div. of Associated Spring Corp., 226 S. Center St., Corry, Pa.

Ⓥ Reliable Spring & Wire Forms Co., Fulton Rd. & Paris Ave., Cleveland 9, Ohio.

Ⓥ Schott Co., Walter L., 9306 Santa Monica Blvd., Beverly Hills, Calif.

Ⓥ U. S. Steel Wire Spring Co., 7800 Finney Ave., Cleveland 5, Ohio.

Ⓥ WEBSTER SPRING CORP., 176-182 Johnson St., Brooklyn 1, N. Y. ADV. PG. 237, 278.

Ⓥ Wickwire Spencer Steel Div., The, Colorado Fuel and Iron Corp., The, 500 Fifth Avenue, New York 18, N. Y.

SPRINGS—*Antenna Tension*

Ⓥ Aeronautical Radio Mfg. Co., 155 First St., Mineola, N. Y.

Ⓥ Barnes-Gibson-Raymond Div., Associated Spring Corp., 6400 Miller Ave., Detroit 11, Mich.

Ⓥ Raymond Mfg. Co. Div. of Associated Spring Corp., 226 S. Center St., Corry, Pa.

Ⓥ Reliable Spring & Wire Forms Co., Fulton Rd. & Paris Ave., Cleveland 9, Ohio.

Ⓥ Ward Products Corp., Div. of The Gabriel Corp., 1523 E. 45th St., Cleveland 3, Ohio.

Ⓥ WEBSTER SPRING CORP., 176-182 Johnson St., Brooklyn 1, N. Y. ADV. PG. 237, 278.

SPRINGS—*Instrument Hairsprings*

Ⓥ Barnes-Gibson-Raymond Div., Associated Spring Corp., 6400 Miller Ave., Detroit 11, Mich.

Ⓥ Precision Products Co., 26 Bedford St., Waltham 54, Mass.

Ⓥ Raymond Mfg. Co. Div. of Associated Spring Corp., 226 S. Center St., Corry, Pa.

Ⓥ U. S. Gauge Div., American Machine & Metals, Inc., Sellersville, Pa.

SPRINGS—*Precision*

Accurate Spring Mfg. Co., 3811 W. Lake St., Chicago, Ill.

Ⓥ Barnes-Gibson-Raymond Div., Associated Spring Corp., 6400 Miller Ave., Detroit 11, Mich.

Ⓥ Chatillon & Sons, John, 93 Cliff St., New York 7, N. Y.

Ⓥ Hunter Spring Co., Lansdale, Pa.

Ⓥ INSTRUMENT SPECIALTIES CO. INC., 254 Bergen Blvd., Little Falls, N. J. ADV. PG. 202.

Ⓥ Lewis Spring & Mfg. Corp., 2656 W. North Ave., Chicago 47, Ill.

Ⓥ Raymond Mfg. Co. Div. of Associated Spring Corp., 226 S. Center St., Corry, Pa.

Ⓥ Reliable Spring & Wire Forms Co., Fulton Rd. & Paris Ave., Cleveland 9, Ohio.

Ⓥ WEBSTER SPRING CORP., 176-182 Johnson St., Brooklyn 1, N. Y. ADV. PG. 237, 278.

Ⓥ Wickwire Spencer Steel Div., The, Colorado Fuel & Iron Corp., 500 Fifth Ave., New York 18, N. Y.

STANDARDS—*Capacitance*

Ⓥ BROWN ELECTRO-MEASUREMENT CORP., 4647 SE. Hawthorne Blvd., Portland 15, Ore. ADV. PG. 276.

Ⓥ FREED TRANSFORMER CO., INC., 1736 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 143.

Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.

Ⓥ Greyrin Co., Box 258, Chicago 90, Ill.

Ⓥ Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.

MacLeod & Hanopol, 10 Joiner St., Charlestown 29, Mass.

Ⓥ MUIRHEAD & CO., INC., Beckenham Kent England. ADV. PG. 71.

STANDARDS—*Frequency*

Ⓥ AMERICAN TIME PRODUCTS, INC., 580 Fifth Ave., New York 19, N. Y. ADV. PG. 60.

Ⓥ Analysis Instrument Co., P. O. Box 231, East Paterson, N. J.

Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.

Ⓥ Bassett Inc., Rex, 307-11 N.W. 1st Ave., Fort Lauderdale, Fla.

Ⓥ BLILEY ELECTRIC CO., Union Station Bldg., Erie, Pa. ADV. PG. 136.

Ⓥ CLARK CRYSTAL CO., 2 Farm Rd., Marlboro, Mass. ADV. PG. 210.

Ⓥ Doolittle Radio, Inc., 7421 S. Loomis Blvd., Chicago 36, Ill.

Ⓥ FREED TRANSFORMER CO., INC., 1736 Feirfield St., Brooklyn 27, N. Y. ADV. PG. 143.

Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.

Ⓥ KNIGHTS CO., JAMES, 131 S. Wells St., Sandwich, Ill. ADV. PG. 190.

Ⓥ LAVOIE LABORATORIES, Morganville, N. J. ADV. PG. 151.

Ⓥ Marconi Instruments Ltd., 23 Beaver St., New York 4, N. Y.

Ⓥ Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.

Monitor Products Co., 815 Fremont Ave., So. Pasadena, Calif.

Ⓥ NORRMAN LABORATORIES, ERNST, Williams Bay, Wis. ADV. PG. 177.

Ⓥ PHILAMON LABORATORIES, 5717 Third Ave., Brooklyn 20, N. Y. ADV. PG. 84.

Ⓥ POLYTECHNIC RESEARCH & DEVELOPMENT CO., INC., 202 Tillary St., Brooklyn 1, N. Y. ADV. PG. 56, 57.

Ⓥ POTTER INSTRUMENT CO., INC., 115 Cutter Mill Rd., Great Neck, N. Y. ADV. PG. 204.

Ⓥ REEVES-HOFFMAN CORP., 321 Cherry St., Carlisle, Pa. ADV. PG. 32.

Ⓥ SPERRY GYROSCOPE CO., Div. of Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.

Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W.C. 2, England.

Ⓥ TIMES FACSIMILE CORP., 229 W. 43rd St., New York 18, N. Y. ADV. PG. 50.

Ⓥ Varo Mfg. Co., Inc., Box 6338, Garland, Texas.

Westline Electronics Co., 11660 Olympic Blvd., Los Angeles 25, Calif.

STANDARDS—*Gamma Ray*

Ⓥ Canadian Radium & Uranium Corp., 630 Fifth Ave., New York 20, N. Y.

Ⓥ Technical Associates, 3730 San Fernando Rd., Glendale 4, Calif.

Ⓥ Tracerlab, Inc., 130 High St., Boston 10, Mass.

Ⓥ U. S. Radium Corp., 535 Pearl St., New York 7, N. Y.

STANDARDS—*Inductance*

Ⓥ COMMUNICATION ACCESSORIES CO., Box 345, 110th St. & Hillcrest Rd., Hickman Hills, Mo. ADV. PG. 178.

Ⓥ FREED TRANSFORMER CO., INC., 1736 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 143.

Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.

Ⓥ Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.

Ⓥ U. S. ELECTRONICS CORP., 276 Warren St., Lyndhurst, N. J. ADV. PG. 266.

STANDARDS—*Laboratory Time*

Ⓥ AMERICAN CHRONOSCOPE CORP., 316 W. First St., Mt. Vernon, N. Y. ADV. PG. 84.

Ⓥ AMERICAN TIME PRODUCTS, INC., 580 Fifth Ave., New York 19, N. Y. ADV. PG. 60.

V indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

V GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 45, 47.
V LAVOIE LABORATORIES, Morganville, N. J. ADV. PG. 213.
V NORRMAN LABORATORIES, ERNST, Williams Bay, Wis. ADV. PG. 177.
V REEVES-HOFFMAN CORP., 321 Cherry St., Carlisle, Pa. ADV. PG. 82.
V Standard Electric Time Co., The, 89 Logan St., Springfield, Mass.
V Vara Mfg. Co., Inc., Box 638, Garland, Texas.

STANDARDS—*Resistance*

V Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
V Dawe Co., 191 Central Ave., Newark 4, N. J.
V GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
V GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 45, 47.
V Ideal Commutator Dresser Co., 1920 Clybourn Ave., Chicago 14, Ill.
V Instrument Laboratories, 315 W. Walton Place, Chicago 10, Ill.
V Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
V Radiation Co., 3211 Ridge Ave., Philadelphia, Pa.
V Sensitive Research Instrument Corporation, 9 Elm Avenue, Mount Vernon, N. Y.
V SHALLCROSS MFG. CO., 10 Jackson Ave., Collingdale, Pa. ADV. PG. 221.

STANDARDS EQUIPMENT—*Calibration*

V Bassett, Inc., Rex, 307-11 N.W. 1st Ave., Fort Lauderdale, Fla.
Burnett Radio Lab., Wm. W. L., 4814 Idaho St., San Diego, Calif.
V ELECTRONIC MEASUREMENTS CO., Red Bank, N. J. ADV. PG. 179.
V GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Laurel Electronics Corp., 394 E. 148th St., New York 54, N. Y.
V MEASUREMENTS CORP., Boonton, N. J. ADV. PG. 185.
V POTTER INSTRUMENT CO., INC., 115 Cutler Man Rd., Great Neck, N. Y. ADV. PG. 204.
V RADIO FREQUENCY LABS., INC., Boonton 2, N. J. ADV. PG. 177.
V RAWSON ELECTRICAL INSTRUMENT CO., 111 Potter St., Cambridge 42, Mass. ADV. PG. 194.
V Radiation Co., 3211 Ridge Ave., Philadelphia, Pa.
V SHALLCROSS MFG. CO., 10 Jackson Ave., Collingdale, Pa. ADV. PG. 221.

STANDS—*Microphone*

V AMPERITE CO., 561 Broadway, New York 12, N. Y. ADV. PG. 218.
V Astatic Corp., The, Conneaut, Ohio.
V Atlas Sound Corp., 1443 39th St., Brooklyn 18, N. Y.
V AVIOMETER DIV. of Maxwell Corp., 662 Pacific St., Brooklyn 17, N. Y. ADV. PG. 66.
V Bogen Co., Inc., David, 663 Broadway, New York 12, N. Y.
V Buttrey Mike Stand Co., 56 Christopher Ave., Brooklyn 12, N. Y.
V ELECTRO-VOICE, INC., Buchanan, Mich. ADV. PG. 203.
V MILES REPRODUCER CO., INC., 812 Broadway, New York 3, N. Y. ADV. PG. 275.
V Orrox Co., Otto K., 1516 Cahuenga, Hollywood 28, Calif.
V Racon Electric Co., Inc., 52 East 19th St., New York 3, N. Y.
V RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 14 to 19, Inside Back and Back Covers.
V TURNER CO., THE, 909 17th Street, N.E., Cedar Rapids, Iowa. ADV. PG. 53.

STANDS—*Speaker*

V Atlas Sound Corp., 1443 39th St., Brooklyn 18, N. Y.
V Bogen Co., Inc., David, 663 Broadway, New York 12, N. Y.
V Racon Electric Co., Inc., 52 E. 19th St., New York 3, N. Y.

STEATITE

See Insulation Materials

STENCILS—*Metal Marking*

V Automatic Co., The, 442 Moore St., Elizabeth 1, N. J.
V Steinlauf, Stamp & Tool Co., Ridgefield Park, Bergen County, N. J.

STETHOGRAPHS AND STETHOPHONES

V Allen Electronics Co., 202 Main St., Worcester, Mass.
V Lawrence Medical Lab., 1 Main St., East Weare, N. H.
V SANBORN CO., 39 Osborn St., Cambridge 39, Mass. ADV. PG. 219.

STETHOSCOPES—*Amplifying*

V Electro-Medical Lab., Inc., Holliston, Mass.
V SANBORN CO., 39 Osborn St., Cambridge 39, Mass. ADV. PG. 219.
Western Sound & Electric Labs., Inc., 865 S. Fifth St., Milwaukee 4, Wis.

STIMULATORS

V Electrodyne Company, 32 Oliver St., Boston, Mass.
V Electro-Medical Lab., Inc., Holliston, Mass.
V ELECTRONIC TUBE CORP., 1200 E. Mermaid Ave., Philadelphia 18, Pa. ADV. PG. 176.
V Grass Instrument Co., 101 Old Colony Ave., Quincy, Mass.
V Manufacturers Engr. & Equip. Corp., Willow Grove, Pa.
Process & Instruments, 60 Greenpoint Ave., Brooklyn 22, N. Y.
V RAHM INSTRUMENTS, INC., 12 West Broadway, New York 7, N. Y. ADV. PG. 178.
V SANBORN CO., 39 Osborn St., Cambridge 39, Mass. ADV. PG. 219.
V Wappler, Inc., 27 W. 24th St., New York 10, N. Y.

STRAIN RELIEFS

Brandywine Fibre Co., 19th & Poplar Sts., Wilmington, Del.
V HEYMAN MFG. CO., 300 Michigan Ave., Kenilworth, N. J. ADV. PG. 26.
V Smith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.
V WALKER CO., GEORGE, 110 Amsterdam Ave., Passaic, N. J. ADV. PG. 208.

STRIPPERS—*Wire*

V Aircraft Marine Products, Inc., 1523 N. Fourth St., Harrisburg, Pa.
Eisler Co., Inc., The, Rush Wire Stripper Div., 104 S. State St., Syracuse 3, N. Y.
V Industry Chemical Products Corp., 472 Frelinghuysen Ave., Newark, N. J.
V GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
V Ideal Industries, Inc., Park & Borden Aves., Sycamore, Ill.
V J F D MFG. CO., 6101-23 Sixteenth Ave., Brooklyn, N. Y. ADV. PG. 254, 264.
V Jiffy Stripper Co., 2224 S. State St., Chicago, Ill.
V Pyramid Products Co., 2224 S. State St., Chicago, Ill.
V Schott Co., Walter L., 9306 Santa Monica Blvd., Beverly Hills, Calif.
V Smith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.
V Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.

STROBOSCOPES

V Communication Measurements Lab., Inc., 120 Greenwich St., New York, N. Y.
V Edgerton, Germeshausen & Grier, Inc., Boston, Mass.
V GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 45, 47.
V North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
Photronic & Electronics Co., 272 Northland Ave., Buffalo 8, N. Y.
V Schott Co., Walter L., 9306 Santa Monica Blvd., Beverly Hills, Calif.
V Strobe Scope Co., W. M., 1515 Sedgwick St., Chicago 10, Ill.

STROBOTRONS

See Tubes

SUPPRESSORS—*Auto Radio Ignition*

Bardach Radio Co., Inc., 145 Hudson St., New York, N. Y.
V Sunbeam, Inc., 42-40 47th St., Woodside, N. Y.
V Carborundum Co., Globar Div., Niagara Falls, N. Y.
V Consolidated Wire & Associated Companies, 1635 S. Loomis St., Chicago 16, Ill.
V Continental Carbon, Inc., 13900 Lorain Ave., Cleveland 11, Ohio.
V ERIE RESISTOR CORP., 644 W. 12th St., Erie, Pa. ADV. PG. 47.
V GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
V Holtzer Mfg. Co., 2601 Florence Ave., Inglewood, Calif.
V Industrial Condenser Corp., 3243 N. California Ave., Chicago 18, Ill.
V INSULINE CORP. OF AMERICA, 36-02 34th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
V INTERNATIONAL RESISTANCE CO., 401 N. Broad St., Philadelphia 8, Pa. ADV. PG. 88, 89.
V J F D MFG. CO., 6101-23 Sixteenth Ave., Brooklyn, N. Y. ADV. PG. 254, 264.
National Electronics Mfg. Co., 35-06 36th St., Long Island City 6, N. Y.
V Ohio Carbon Co., 12508 Berea Rd., Cleveland 11, Ohio.
V Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
V Philmore Mfg. Co., 113 University Place, New York 3, N. Y.
V Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.

SUPPRESSORS—*Fluorescent Light*

V Deutschmann Corp., Tobe, 921 Providence Highway, Norwood, Mass.
Filtron Co., Inc., The, 38-25 Bell Blvd., Bayside, L. I., N. Y.
V Industrial Condenser Corp., 3243 N. California Ave., Chicago 18, Ill.
V J F D MFG. CO., 6101-23 Sixteenth Ave., Brooklyn, N. Y. ADV. PG. 254, 264.
V Miller Co., J. W., 5917 S. Main St., Los Angeles, Calif.
V Sprague Electric Co., North Adams, Mass.

SUPPRESSORS—*Noise*

V BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
V Bassett, Inc., Rex, 307-11 N.W. 1st Ave., Fort Lauderdale, Fla.
Coil Winders, Inc., 61 Bergen St., Brooklyn 2, N. Y.
V Continental Carbon, Inc., 13900 Lorain Ave., Cleveland 11, Ohio.
V Deutschmann Corp., Tobe, 921 Providence Highway, Norwood, Mass.
V ERIE RESISTOR CORP., 644 W. 12th St., Erie, Pa. ADV. PG. 47.
Filtron Co., Inc., The, 38-25 Bell Blvd., Bayside, L. I., N. Y.
V Fisher Radio Corp., 41 E. 47th St., New York, N. Y.
V GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
V Hutters Mfg. Co., 1601 Florence Ave., Inglewood, Calif.
V J F D MFG. CO., 6101-23 Sixteenth Ave., Brooklyn, N. Y. ADV. PG. 254, 264.
V Miller Co., J. W., 5917 S. Main St., Los Angeles, Calif.
V Scott, Inc., Hermon Hosmer, 385 Putnam Ave., Cambridge 39, Mass.
V Somerset Laboratories, Inc., 1701 Palisades Ave., Union City, N. J.
V Sprague Electric Co., North Adams, Mass.
V Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.

SUPPRESSORS—*Parasitic*

V BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
V Carborundum Co., The Globar Div., Niagara Falls, N. Y.
Coil Winders, Inc., 61 Bergen St., Brooklyn 2, N. Y.
V ERIE RESISTOR CORP., 644 W. 12th St., Erie, Pa. ADV. PG. 47.
V INTERNATIONAL RESISTANCE CO., 401 N. Broad St., Philadelphia 8, Pa. ADV. PG. 88, 89.
V OHMITE MFG. CO., 4835 W. Flournoy St., Chicago 44, Ill. ADV. PG. 83.

SURFACE ANALYZERS AND COMPARATORS

See Analyzers

SUSPENSIONS—*Speaker*

V Hawley Products Co., St. Charles, Ill.

SWITCH PARTS

Call Letter Tabs

Plastic Fabricators Co., 440 Sansome St., San Jeronimo & Blair Drs., Silver Spring, Md.
Vitrohm, Inc., 95 Mercer St., New York 12, N. Y.

SWITCHBOARDS—*Radio*

American Communications Corp., 306 Broadway, New York 7, N. Y.
Northeastern Engineering, Inc., Manchester, N. H.
Smulekar & Co., Inc., A. F., 202 Tillary St., Brooklyn 1, N. Y.

SWITCHES—*Automatic*

V Applied Science Corp. of Princeton, The, P. O. Box 441, Princeton, N. J.
V Automatic Electric Sales Corp., 1033 W. Van Buren St., Chicago 7, Ill.
V Automatic Switch Co., 391 Lakeside Ave., Orange, N. J.
V Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.
V Connecticut Telephone & Electric Div., Great American Industries, Inc., 70 Alumnia St., Meriden, Conn.
V CRAMER CO., INC., R. W., Box 13, Centerbrook, Conn. ADV. PG. 208.
V Fasco Industries, Inc., Rochester 2, N. Y.

V indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

V Federal Electric Products Co., 50 Paris St., Newark, N. J.
V General Controls Co., Glendale 1, Calif.
Lumenite Electric Co., 407 S. Dearborn St., Chicago, Ill.
V Mallory & Co., Inc., P. R., 3029 E. Washington St., Indianapolis 6, Ind.
V Minneapolis-Honeywell Regulator Co., 2753 Fourth Avenue, S., Minneapolis, Minn.
V RUSSELL & STOLL CO., INC., 125 Barclay St., New York 7, N. Y. ADV. PG. 211.

SWITCHES—*Coaxial Cable*

V BIRD ELECTRONIC CORP., 1800 E. 38th St., Cleveland 14, Ohio. ADV. PG. 194, 195.
V Designers for Industry, Inc., 2915 Detroit Ave., Cleveland 13, Ohio.
V General Communication Co., 630 Commonwealth Ave., Boston 15, Mass.
V Press Wireless Mfg. Co., Inc., Centaque Rd., Hicksville, L. I., N. Y.
V Product Development Co., Inc., Arlington, N. J.
Selector Industries, Inc., 401 E. 138th St., New York 54, N. Y.
V Weymouth Instrument Co., 1440 Commercial St., East Weymouth 89, Mass.
V Working Associates, Inc., 66 Needham St., Newton Highlands 62, Mass.

SWITCHES—*Control*

V Applied Science Corp. of Princeton, The, P. O. Box 44, Princeton, N. J.
V CENTRALAB DIV. OF GLOBE UNION INC., 900 E. Keefe Ave., Milwaukee, Wis. ADV. PG. 64, 65.
V CINEMA ENGINEERING CO., 1510 W. Verdugo Ave., Burbank, Calif. ADV. PG. 186.
V Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
V Cutler-Hammer, Inc., 411 No. 12th St., Milwaukee 1, Wis.
V Daven Co., 191 Central Ave., Newark 4, N. J.
V GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
V Grigsby-Allison Co., Inc., 407 N. Salem Ave., Arlington Heights, Ill.
V GUARDIAN ELECTRIC MFG. CO., 1621 W. Walnut St., Chicago 22, Ill. ADV. PG. 31.
V I-B-L Instrument Co., Sycamore & Mill Rds., Clifton Heights, Pa.
Lumenite Electric Co., 407 S. Dearborn St., Chicago, Ill.
V Micro Switch Div. of First Industrial Corp., 7 Spring St., Freeport, Ill.
V Minneapolis-Honeywell Regulator Co., 2753 Fourth Ave., S., Minneapolis, Minn.
V Mu Switch Division, Arco Switch Co., 38 Pequit St., Canton, Mass.
V National Acme Co., 176 E. 131st St., Cleveland 8, Ohio.
V Roller-Smith, Bethlehem, Pa.
V RUSSELL & STOLL CO., INC., 125 Barclay St., New York 7, N. Y. ADV. PG. 211.
V Tech Laboratories, Inc., Berjen & Edsall Blvds., Palisades Park, N. J.
V WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

SWITCHES—*Decade*

V BROWN ELECTRO-MEASUREMENT CORP., 4637 SE Hawthorne Blvd., Portland 15, Oregon. ADV. PG. 276.
V CENTRALAB DIV. OF GLOBE UNION INC., 900 E. Keefe Ave., Milwaukee, Wis. ADV. PG. 64, 65.
V CINEMA ENGINEERING CO., 1510 W. Verdugo Ave., Burbank, Calif. ADV. PG. 186.
V Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
V Daven Co., 191 Central Ave., Newark 4, N. J.
V GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
V Grigsby-Allison Co., Inc., 407 N. Salem Ave., Arlington Heights, Ill.
V I-B-L Instrument Co., Sycamore & Mill Rds., Clifton Heights, Pa.
V Sensitive Research Instrument Corp., 9 Elm Ave., Mt. Vernon, N. Y.
V SHALLCROSS MFG. CO., 10 Jackson Ave., Collingdale, Pa. ADV. PG. 222.
V Tech Laboratories, Inc., Berjen & Edsall Blvds., Palisades Park, N. J.

SWITCHES—*Duplex*

V SHALLCROSS MFG. CO., 10 Jackson Ave., Collingdale, Pa. ADV. PG. 222.

SWITCHES—*Electronic*

V Acro Electric Co., 1305 Superior Ave., Cleveland 14, Ohio.
V Airborne Electronics Co., Metropolitan Airport, Hangar No. 7, Van Nuys, Calif.
V Applied Science Corp. of Princeton, The, P. O. Box 44, Princeton, N. J.
V CENTRALAB DIV. OF GLOBE UNION INC., 900 E. Keefe Ave., Milwaukee, Wis. ADV. PG. 64, 65.
V Cutler-Hammer, Inc., 411 N. 12th St., Milwaukee 1, Wis.
V GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
V HEATH CO., Benton Harbor, Mich. ADV. PG. 279.
V Industrial Electronics Co., Inc., Hanover, Mass.
V INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
Lewis & Kaufman, Inc., P. O. Box 337, 90 El Rancho Ave., Los Gatos, Calif.
Lumenite Electric Co., 407 S. Dearborn St., Chicago 5, Ill.
V Mallory & Co., Inc., P. R., 3029 E. Washington St., Indianapolis 6, Ind.
V Manning, Maxwell & Moore, Inc., Stratford, Conn.
V Philbrick Researches, Inc., 230 Congress St., Boston 10, Mass.
V Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
V SHALLCROSS MFG. CO., 10 Jackson Ave., Collingdale, Pa. ADV. PG. 222.
V STACKPOLE CARBON CO., St. Marys, Pa. ADV. PG. 166, 167.

SWITCHES—*Float Type*

V Allen-Bradley Co., 136 W. Greenfield Ave., Milwaukee 4, Wis.
V Clark Controller Co., 1146 E. 152nd St., Cleveland 10, Ohio.
V Micro Switch Div. of First Industrial Corp., 7 Spring St., Freeport, Ill.
V Thomson Electric Mfg. Co., Plainville, Conn.
V WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

SWITCHES—*Key*

V ALDEN PRODUCTS CO., 117 N. Main St., Brockton 64, Mass. ADV. PG. 235.
V Automatic Electric Sales Corp., 1033 W. Van Buren St., Chicago 7, Ill.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
V Clare & Co., C. P., 4719 Sunnyside Ave., Chicago 30, Ill.
V Connecticut Telephone & Electric Div., Great American Industries, Inc., 70 Britannia St., Meriden, Conn.
V GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
V GENERAL ELECTRIC CO., Construction Materials Dept., 1285 Boston Ave., Bridgeport 2, Conn. ADV. PG. 5 to 18.
V Minneapolis-Honeywell Regulator Co., 2753 Fourth Avenue, S., Minneapolis, Minn.
V Molded Insulation Co., Aircraft Control Div., 335 E. Price St., Philadelphia, Pa.
V Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
V WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

SWITCHES—*Knife*

Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Eagle Electric Mfg. Co., Inc., 23-10 Bridge Plaza S., Long Island City, N. Y.
V Federal Electric Products Co., 50 Paris St., Newark, N. J.
V GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
V GENERAL ELECTRIC CO., Construction Materials Dept., 1285 Boston Ave., Bridgeport 2, Conn. ADV. PG. 5 to 18.
V Gregory Mfg. Co., Inc., The, 67 Franklin St., New Haven 11, Conn.
Hetherington, Inc., Sharon Hill, Pa.
V INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
V Kulton Electric Mfg. Co., 123 New Jersey Railroad Ave., Newark 5, N. J.
V Philmore Mfg. Co., 113 University Place, New York 3, N. Y.
V Smith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.
V Thomson Electric Mfg. Co., Plainville, Conn.
V WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Wrist Electric Co., Inc., C. D., 70-17 83rd St., Glendale, L. I., N. Y.

SWITCHES—*Lever*

V Automatic Electric Sales Corp., 1033 W. Van Buren St., Chicago 7, Ill.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
V CENTRALAB DIV. OF GLOBE UNION INC., 900 E. Keefe Ave., Milwaukee 1, Wis. ADV. PG. 64, 65.
V Clare & Co., C. P., 4719 Sunnyside Ave., Chicago 30, Ill.
V Connecticut Telephone & Electric Div., Great American Industries, Inc., 70 Britannia St., Meriden, Conn.
V GENERAL CONTROL COMPANY, 1200 Soldiers Field Rd., Boston 34, Mass. ADV. PG. 149.
V GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
V Mallory & Co., Inc., P. R., 3029 E. Washington St., Indianapolis 6, Ind.
V Philmore Mfg. Co., 113 University Place, New York 3, N. Y.
V Smith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.
V SWITCHCRAFT, INC., 1328-30 N. Halsted St., Chicago 22, Ill. ADV. PG. 162.

SWITCHES—*Limit*

V Acro Electric Co., 1310 Superior Ave., Cleveland 14, Ohio.
V Allen-Bradley Co., 136 W. Greenfield Ave., Milwaukee 4, Wis.
V Automatic Electric Sales Corp., 1033 W. Van Buren St., Chicago 7, Ill.
V Clark Controller Co., 1146 E. 152nd St., Cleveland 10, Ohio.
V Cutler-Hammer, Inc., 411 N. 12th St., Milwaukee 1, Wis.
General Controls Co., Glendale 1, Calif.
V GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Hetherington, Inc., Sharon Hill, Pa.
V Micro Switch, Div. of First Industrial Corp., 7 Spring St., Freeport, Ill.
V Minneapolis-Honeywell Regulator Co., 2753 Fourth Ave., S., Minneapolis, Minn.
V Mu Switch Division, Acro Switch Co., 38 Pequit St., Canton 31, Mass.
V National Acme Co., 176 E. 131st St., Cleveland 8, Ohio.
V ROTRON MFG. CO., INC., 7-9 Schoonmaker Lane, Woodstock, N. Y. ADV. PG. 160.
V Unimotor Switch Div. of W. L. Maxson Corp., 460 W. 34th St., New York 1, N. Y.
V WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

SWITCHES—*Mercury*

V Durakool, Inc., 1010 N. Main St., Elkhart, Ind.
V GENERAL ELECTRIC CO., Construction Materials Dept., 1285 Boston Ave., Bridgeport 2, Conn. ADV. PG. 5 to 18.
V GENERAL ELECTRIC CO., Electronics Dept., Tube Div., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Mark Electrical Devices, Inc., 43 Glenside Ave., Wyncote, Pa.
V Minneapolis-Honeywell Regulator Co., 2753 Fourth Ave., S., Minneapolis, Minn.

SWITCHES—*Pressure Operated*

V Allen-Bradley Co., 136 W. Greenfield Ave., Milwaukee 4, Wis.
V Cook Electric Co., 2700 Southport Ave., Chicago 14, Ill.
V Coral Designs, P. O. Box 248, Forest Hills, N. Y.
V Cutler-Hammer, Inc., 411 N. 12th St., Milwaukee 1, Wis.
V GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
V Magnavox Co., The, Components Div., Fort Wayne 4, Indiana.
V Micro Switch Div. of First Industrial Corp., 7 Spring St., Freeport, Ill.
V Minneapolis-Honeywell Regulator Co., 2753 Fourth Avenue, S., Minneapolis, Minn.
V U. S. Gauge Div., American Machine & Metals, Inc., Sellersville, Pa.
V WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

SWITCHEES—*Rotary and Band Change*

V Applied Science Corp. of Princeton, The, P. O. Box 44, Princeton, N. J.
V Ark Les Switch Corp., 55 Water St., Watertown 72, Mass.
V BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
V CENTRALAB DIV., GLOBE UNION, INC., 900 E. Keefe Ave., Milwaukee 1, Wis. ADV. PG. 64, 65.
V CLAROSTAT MFG. CO., INC., Dover, N. H. ADV. PG. 227.
V Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
V Communication Products Co., Inc., Broadway & Clark St., Keyport, N. J.
V Daven Co., 191 Central Ave., Newark 4, N. J.
V Eastern Specialty Co., Philadelphia 40, Pa.
V General Control Company, 1200 Soldiers Field Rd., Boston 34, Mass. ADV. PG. 149.
V GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
V Grigsby-Allison Co., Inc., 407 N. Salem Ave., Arlington Heights, Ill.
V INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
V I-B-L Instrument Co., Sycamore & Mill Rds., Clifton Heights, Pa.
V JBT INSTRUMENTS INC., 441 Chapel St., New Haven 8, Conn. ADV. PG. 261.
V J F D MFG. CO., 6101-23 Sixteenth Ave., Brooklyn, N. Y. ADV. PG. 254, 264.

Ⓥ indicates IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

Ⓥ Lewis Engineering Co., 52 Rubber Ave., Naugatuck, Conn.
Ⓥ Mallory & Co., Inc., P. R., 3029 E. Washington St., Indianapolis 6, Ind.
Oak Mfg. Co., 1260 N. Clybourn Ave., Chicago 10, Ill.
Ⓥ OHMITE MFG. CO., 4835 W. Flournoy St., Chicago 44, Ill. ADV. PG. 83.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Selector Industries, Inc., 401 E. 134th St., New York 54, N. Y.
Ⓥ SHALLCROSS MFG. CO., 10 Jackson Ave., Collingdale, Pa. ADV. PG. 221.
Ⓥ Smith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.
Ⓥ STACKPOLE CARBON CO., St. Marys, Pa. ADV. PG. 166, 167.
Ⓥ SWITCHCRAFT, INC., 1328-30 N. Halsted St., Chicago 22, Ill. ADV. PG. 162.
Ⓥ Tech Laboratories, Inc., Bergen & Edsall Blvds., Palisades Park, N. J.
Ⓥ U. S. Instrument Corp., 409 Broad Street, Summit, N. J.

SWITCHES—*Safety*

Bussell & Co., S. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ Cook Electric Co., 2700 Southport Ave., Chicago 14, Ill.
Ⓥ Cutler-Hammer, Inc., 811 No. 14th St., Milwaukee 1, Wis.
Ⓥ Federal Electric Products Company, 50 Paris St., Newark 5, N. J.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Hetherington, Inc., Sharon Hill, Pa.
Ⓥ Kurman Electric Mfg. Co., 123 New Jersey Railroad Ave., Newark 5, N. J.
Ⓥ Mu-Switch Div. of First Industrial Corp., 7 Spring St., Freeport, Ill.
Mu-Switch Division, Acro Switch Co., 38 Pequot St., Canton, Mass.
Ⓥ ROTRON MFG. CO., INC., 7-9 Schoonmaker Lane, Woodstock, N. Y. ADV. PG. 268.
Ⓥ RUSSELL & STOLL CO., INC., 125 Barclay St., New York 7, N. Y. ADV. PG. 211.
Ⓥ Standard Switch, Inc., Mfg. Div., Plainville, Conn.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

SWITCHES—*Slide*

Ⓥ Ark-Les Switch Corp., 55 Water St., Watertown 72, Mass.
Ⓥ CENTRALAB DIV., Globe Union Inc., 900 E. Keefe Ave., Milwaukee 1, Wis. ADV. PG. 64, 65.
Four Hersee Co., 20 Old Colony Ave., Boston 27, Mass.
Ⓥ Dial Remote Control Co., Garden City, Mich.
Ⓥ Elgar Co., 549 Market St., Camden 2, N. J.
Ⓥ FEDERAL SCREW PRODUCTS INC., 224 W. Huron St., Chicago 10, Ill. ADV. PG. 271.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Grigsby Allison Co., Inc., 407 N. Salem Ave., Arlington Heights, Ill.
Ⓥ INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City 6, N. Y. ADV. PG. 246, 247.
Ⓥ Mu-Switch Div. of First Industrial Corp., 7 Spring St., Freeport, Ill.
Muter Co., 1255 S. Michigan Ave., Chicago, Ill.
Oak Mfg. Co., 1260 N. Clybourn Ave., Chicago 10, Ill.
Ⓥ Ohmite Mfg. Co., 4835 W. Flournoy St., Chicago 44, Ill. ADV. PG. 83.
Ⓥ SHALLCROSS MFG. CO., 10 Jackson Ave., Collingdale, Pa. ADV. PG. 221.
Ⓥ Smith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.
Ⓥ STACKPOLE CARBON CO., St. Marys, Pa. ADV. PG. 166, 167.
Stokes Co., 19 New Park Ave., Hartford 6, Conn.
Ⓥ Wirt Co., 5221 Greene Street, Philadelphia 44, Pa.

SWITCHES—*Snap Action*

Ⓥ Acro Electric Co., 1305 Superior Ave., Cleveland 14, Ohio.
Ⓥ AVIOMETER DIV. OF ROANWELL CORP., 1401 South Main St., Boone, Iowa. ADV. PG. 64, 65.
Ⓥ CENTRALAB DIV. OF GLOBE UNION INC., 900 E. Keefe Ave., Milwaukee 1, Wis. ADV. PG. 64, 65.
Ⓥ Cook Electric Co., 2700 Southport Ave., Chicago 14, Ill.
Ⓥ Cutler-Hammer, Inc., 811 No. 14th St., Milwaukee 1, Wis.
Ⓥ Dixon Co., 191 Central Ave., Newark 4, N. J.
Ⓥ Elgar Co., 549 Market St., Camden 2, N. J.
Ⓥ GENERAL CONTROL COMPANY, 1600 Soldiers Field Rd., Boston 35, Mass. ADV. PG. 144.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ GENERAL ELECTRIC CO., Construction Materials Dept., 1285 Boston Ave., Bridgeport 2, Conn. ADV. PG. 5 to 18.
Ⓥ GRAYHILL, 4524 N. Madison St., Chicago 24, Ill. ADV. PG. 250.
Ⓥ GUARDIAN ELECTRIC MFG. CO., 1621-W Arvind St., Chicago 47, Ill. ADV. PG. 61.
Hetherington, Inc., Sharon Hill, Pa.
Ⓥ Hofman Engineering Corp., Ansley, Mich.
Ⓥ J F D MFG. CO., 6101-23 Sixteenth Ave., Brooklyn 4, N. Y. ADV. PG. 254, 264.
Ⓥ Micro Switch Div. of First Industrial Corp., 7 Spring St., Freeport, Ill.
Ⓥ Mu-Switch Division, Acro Switch Co., 38 Pequot St., Canton, Mass.
Ⓥ National Acme Co., 170 E. 131st St., Cleveland 8, Ohio.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Smith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.
Ⓥ STACKPOLE CARBON CO., St. Marys, Pa. ADV. PG. 166, 167.
Ⓥ Tenney Co., Div. of United-Carr Fastener Corp., 459 Watertown St., Newtonville, Mass.

SWITCHES—*Step Type*

Ⓥ Automatic Electric Sales Corp., 1033 W. Van Buren St., Chicago 7, Ill.
Ⓥ CINEMA ENGINEERING CO., 1510 W. Verdugo Ave., Burbank, Calif. ADV. PG. 186.
Ⓥ Clare & Co., C. P., 4719 Sunnyside Ave., Chicago 30, Ill.
Ⓥ Cook Instrument Co., 1328 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ Communication Measurements Lab., Inc., 120 Greenwich St., New York, N. Y.
Ⓥ Dixon Co., 191 Central Ave., Newark 4, N. J.
Ⓥ FEDERAL TELEPHONE AND RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Industrial Timer Corp., 115 Edison Pl., Newark 5, N. J.
Ⓥ RADIO RECEPTOR CO., 251 W. 19th St., New York 11, N. Y. ADV. PG. 188.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ Tech Laboratories, Inc., Bergen & Edsall Blvds., Palisades Park, N. J.

SWITCHES—*Tap*

Ⓥ AMERICAN PHENOLIC CORPORATION, 1830 S. 54th Ave., Chicago 50, Ill. ADV. PG. 191.
Ⓥ CENTRALAB DIV., GLOBE UNION INC., 900 E. Keefe Ave., Milwaukee 1, Wis. ADV. PG. 64, 65.
Ⓥ CINEMA ENGINEERING CO., 1510 W. Verdugo Ave., Burbank, Calif. ADV. PG. 186.
Ⓥ Cook Instrument Co., 1328 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ Communication Products Co., Inc., Broadway & Clark St., Keyport, N. J.
Ⓥ Dixon Co., 191 Central Ave., Newark 4, N. J.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ GRAYHILL, 4524 N. Madison St., Chicago 24, Ill. ADV. PG. 250.
Ⓥ Grigsby Allison Co., Inc., 407 N. Salem Ave., Arlington Heights, Ill.
Ⓥ OHMITE MFG. CO., 4835 W. Flournoy St., Chicago 44, Ill. ADV. PG. 83.
Ⓥ SHALLCROSS MFG. CO., 10 Jackson Ave., Collingdale, Pa. ADV. PG. 221.
Ⓥ Tech Laboratories, Inc., Bergen & Edsall Blvds., Palisades Park, N. J.

SWITCHES—*Thermal*

Ⓥ Acro Electric Co., 1305 Superior Ave., Cleveland 14, Ohio.
Ⓥ Barber-Colman Co., Rockford, Ill.
Ⓥ Cook Instrument Co., 1328 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ Cook Electric Co., 2700 Southport Ave., Chicago 14, Ill.
Ⓥ EDISON, INC., THOMAS A., Instrument Div., West Orange, N. J. ADV. PG. 128.
Ⓥ Fenwal Electric Mfg. Co., Inc., 80 Sparks St., Mt. Vernon, N. Y.
Mark Electrical Devices Inc., 33 Glenside Ave., Wyndcliffe, Pa.
Ⓥ Minneapolis-Honeywell Regulator Co., 2753 Fourth Ave. S., Minneapolis, Minn.
Ⓥ Mu-Switch Division, Acro Switch Co., 38 Pequot St., Canton, Mass.
Ⓥ Standard Electronic Products Co., 802 E. 1st St., Dayton, Ohio.
Ⓥ Thermal Co., George, 413 Market St., Newark 1, N. J.
Ⓥ Wire Goods Corp., American Machine & Metals, Inc., East Moline, Ill.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

SWITCHES—*Time*

Ⓥ Allen-Bradley Co., 136 W. Greenfield Ave., Milwaukee 4, Wis.
Ⓥ Automatic Temperature Control Co., Inc., 5218 Parrish Ave., Philadelphia 44, Pa.
Ⓥ Cook Electric Co., 2700 Southport Ave., Chicago 14, Ill.
Ⓥ CRAMER CO., INC., R. W., Box 17, Centerbrook, Conn. ADV. PG. 258.
Ⓥ Cutler-Hammer, Inc., 811 N. 12th St., Milwaukee 1, Wis.
Ⓥ Eagle Signal Corp., Moline, Ill.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ HAYDON CO., A. W., THE, 232 N. Elm St., Waterbury, Conn. ADV. PG. 236.
Ⓥ HAYDON MFG. CO., INC., 584 E. Elm St., Torrington, Conn. ADV. PG. 182, 183.
Ⓥ Industrial Timer Corp., 115 Edison Pl., Newark 5, N. J.
Ⓥ Lambs & Syr, Inc., 104 Fifth Ave., New York 11, N. Y.
Ⓥ Lenkurt Laboratories, 50 E. 10th St., New York 3, N. Y.
Ⓥ Lobel-Flansburgh Co., 103 W. Third St., Cincinnati 2, Ohio.
Lumenite Electric Co., 407 S. Dearborn St., Chicago 5, Ill.
Ⓥ Mallory & Co., Inc., P. R., 3029 E. Washington St., Indianapolis 6, Ind.
Ⓥ Minneapolis-Honeywell Regulator Co., 2753 Fourth Ave. S., Minneapolis, Minn.
Ⓥ Paragon Electric Co., Two Rivers, Wisconsin.
Ⓥ Reliance Automatic Lighting Co., 1919 Mead St., Racine, Wis.
Ⓥ Rhodes, Inc., M. H., 30 Bartholomew Ave., Hartford, Conn.
Ⓥ Tork Clock Co., Inc., 1 Grove St., Mt. Vernon, N. Y.
Ⓥ WARD LEONARD ELECTRIC CO., 31 South St., Mt. Vernon, N. Y. ADV. PG. 51, 52.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Zenith Electric Co., 152 W. Walton St., Chicago 10, Ill.

SWITCHES—*Toggle and Pushbutton*

Ⓥ Acro Electric Co., 1305 Superior Ave., Cleveland 14, Ohio.
Ⓥ Ark-Les Switch Corp., 55 Water St., Watertown 72, Mass.
Ⓥ Bud Radio, Inc., 2118 E. 55th St., Cleveland 3, Ohio.
Ⓥ CINEMA ENGINEERING CO., 1510 W. Verdugo Ave., Burbank, Calif. ADV. PG. 186.
Ⓥ Clare & Co., C. P., 4719 Sunnyside Ave., Chicago 30, Ill.
Cole Hersee Co., 20 Old Colony Ave., Boston 27, Mass.
Ⓥ Cutler-Hammer Inc., 811 N. 12th St., Milwaukee 1, Wis.
Ⓥ FEDERAL SCREW PRODUCTS INC., 224 W. Huron St., Chicago 10, Ill. ADV. PG. 271.
Ⓥ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 270.
Ⓥ GENERAL CONTROL COMPANY, 1600 Soldiers Field Rd., Boston 35, Mass. ADV. PG. 144.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ GENERAL ELECTRIC CO., Construction Materials Dept., 1285 Boston Ave., Bridgeport, Conn. ADV. PG. 5 to 18.
Ⓥ GRAYHILL, 4524 N. Madison St., Chicago 24, Ill. ADV. PG. 250.
Ⓥ Grigsby Allison Co., Inc., 407 N. Salem Ave., Arlington Heights, Ill.
Ⓥ Hart Mfg. Co., 110 Bartholomew Ave., Hartford 1, Conn.
Hetherington, Inc., Sharon Hill, Pa.
Ⓥ Howard Mfg. Corp., 1401 South Main St., Council Bluffs, Iowa.
Ⓥ Industrial Instr., Harvey Wallingford 2, Conn.
Ⓥ INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City 6, N. Y. ADV. PG. 246, 247.
Ⓥ J F D MFG. CO., 6101-23 Sixteenth Ave., Brooklyn 4, N. Y. ADV. PG. 254, 264.
Ⓥ Jones Electric Mfg. Co., 40 South St., Mt. Vernon, N. Y.
Ⓥ Mallory & Co., Inc., P. R., 3029 E. Washington St., Indianapolis 6, Ind.
Ⓥ Micro Switch Div. of First Industrial Corp., 7 Spring St., Freeport, Ill.
Ⓥ Minneapolis-Honeywell Regulator Co., 2753 Fourth Ave. S., Minneapolis, Minn.
Ⓥ Morley Co., Frank W., 1700 Soldiers Field Rd., Boston 35, Mass.
Oak Mfg. Co., 1260 N. Clybourn Ave., Chicago 10, Ill.
Ⓥ Post & Seymour, Inc., Solvay Station, Syracuse, N. Y.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Pioneer Mfg. Co., 113 University Place, New York 3, N. Y.
Ⓥ R. P. M. Div., Fuse Wire Corp., Logansport, Ind.
Ⓥ RUSSELL & STOLL CO., INC., 125 Barclay St., New York 7, N. Y. ADV. PG. 211.
Ⓥ Smith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.
Ⓥ SWITCHCRAFT, INC., 1328-30 N. Halsted St., Chicago 22, Ill. ADV. PG. 162.
Ⓥ Tenney Co., Div. United-Carr Fastener Corp., 459 Watertown St., Newtonville, Mass.
Ⓥ WARD LEONARD ELECTRIC CO., 31 South St., Mt. Vernon, N. Y. ADV. PG. 51, 52.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

SWITCHES—*TR*

Ⓥ Smith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

SWITCHES—*Vacuum*

ⓋCHATHAM ELECTRONICS CORP., 475 Washington St., Newark 2, N. J. ADV. PG. 126.
ⓋCook Electric Co., 2700 Southport Ave., Chicago 14, Ill.
ⓋCutler-Hammer, Inc., 411 No. 12th St., Milwaukee 1, Wis.
ⓋDistillation Products Industries, Vacuum Equipment Div., 755 Ridge Rd. W., Rochester 3, N. Y.
ⓋEitel-McCullough Inc., San Bruno, Calif.
ⓋGENERAL ELECTRIC CO., Electronics Dept., Tube Div., Schenectady 5, N. Y. ADV. PG. 5 to 18.
ⓋJENNINGS RADIO MFG. CO., 1098 E. William St., San Jose 12, Calif. ADV. PG. 114, 115.
Mack Electrical Devices Inc., 43 Glenside Ave., Wyncote, Pa.
ⓋSkaneateles Mfg. Co., Inc., 122 Dickerson St., Syracuse, N. Y.
Sperti, Inc., Cincinnati 12, Ohio.
ⓋU. S. Gauge Div., American Machine & Metals, Inc., Sellersville, Pa.
ⓋWallace & Tiernan Products, Inc., Belleville 9, N. J.

SYNCHRONIZERS—*Electronic*

ⓋAcme Telectronic Div., of NEA Service, Inc., West Third & Lakeside, Cleveland 13, Ohio.
ⓋBurlington Instrument Co., Burlington, Iowa.
ⓋControl Corp., 716 Central Ave., Minneapolis 14, Minn.
ⓋElectronic Associates, Inc., Long Branch, N. J.
ⓋNORDMAN LABORATORIES, ERNST, Williams Bay, Wis. ADV. PG. 177.
ⓋPress Wireless Mfg. Co., Inc., Cantiague Rd., Hicksville, L. I., N. Y.
ⓋRangertone, Inc., 73 Winthrop St., Newark 4, N. J.

SYNCHRONIZERS—*Electronic Aircraft Magneto*

ⓋSPERRY GYROSCOPE CO., Div. of Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.

SYNCROSCOPES

ⓋBROWNING LABORATORIES, INC., 750 Main St., Winchester, Mass. ADV. PG. 30.
ⓋCosor (Canada) Ltd., 301-303 Windsor St., Halifax, N. S., Canada.
ⓋINDUSTRIAL ELECTRONICS, INC., 2457 Woodward Ave., Detroit 1, Mich. ADV. PG. 265.
ⓋMaries Mfg. Co., James, 150 Exchange St., Malden, Mass.
ⓋRadioactive Products, Inc., 3201 E. Woodbridge St., Detroit 7, Mich.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
ⓋSYLVANIA ELECTRIC PRODUCTS, INC., 1740 Broadway, New York 19, N. Y. ADV. PG. 286 to 290.
ⓋWATERMAN PRODUCTS CO., INC., 2445-63 Emerald St., Philadelphia 25, Pa. ADV. PG. 162.
ⓋWESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

TACHOMETERS—*Electronic*

ⓋBailey Meter Co., 1044 Ivanhoe Rd., Cleveland 10, Ohio.
ⓋBerkeley Scientific Co., Richmond, Calif.
ⓋC. G. S. LABORATORIES, INC., 36 Lodlow St., Stamford, Conn. ADV. PG. 244.
ⓋCole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
ⓋElectric Heat Control Co., The, 9123 Inman Ave., Cleveland 5, Ohio.
ⓋEsterline Angus Co., Inc., P. O. Box 596, Indianapolis 6, Ind.
ⓋGENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
ⓋGENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
ⓋHEWLETT-PACKARD CO., 395 Page Mill Rd., Palo Alto, Calif. ADV. PG. 68, 69.
Ideal Industries, Inc., Park & Bordon Avenues, Sycamore, Ill.
ⓋKAY ELECTRIC CO., 14 Maple Ave., Pinebrook, N. J. ADV. PG. 141.
ⓋMinneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Roberts Aves., Philadelphia 44, Pa.
ⓋNorth American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
ⓋNucleonic Corp. of America, The, 347 Union St., Brooklyn 31, N. Y.
ⓋPOTTER INSTRUMENT CO., INC., 115 Cutter Mill Rd., Great Neck, N. Y. ADV. PG. 204.
ⓋReeves Instrument Corp., 215 E. 91st St., New York, N. Y.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Shultz Co., Inc., Herman H., 22 Park Place, New York 7, N. Y.
ⓋWestberg Mfg. Co., 612 N. Michigan Ave., Chicago 11, Ill.
ⓋWESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Avenue, Newark 5, N. J. ADV. PG. 108.
ⓋZermeñow Co., O., 15 Park Row, New York 7, N. Y.

TAPE—*Magnetic Recording*

ⓋAUDIO DEVICES INC., 444 Madison Ave., New York 22, N. Y. ADV. PG. 37.
ⓋBRUSH DEVELOPMENT CO., THE, 3405 Perkins Ave., Cleveland 14, Ohio. ADV. PG. 124, 125.
ⓋFidelitone Corp., 1616 Devon Ave., Chicago 26, Ill.
ⓋMinnesota Mining & Mfg. Co., 900 Fauquier Ave., St. Paul, Minn.
ⓋSeradio Industries, Opelika, Ala.
ⓋREEVES SOUNDCRAFT CORP., 35-54 36th St., Long Island City, N. Y. ADV. PG. 171.

TAPES

See Insulation Parts

TECHNICAL BOOKS—*Publishers*

The following listings do not carry the V identification as individual books are not listed.

Academic Press Inc., 125 E. 23rd St., New York 10, N. Y.
American Institute of Electrical Engineers, 33 W. 39th St., New York, N. Y.
American Radio Relay League, West Hartford, Conn.
American Standards Association, 70 E. 45th St., New York, N. Y.
Audel & Co., Theodore, 49 W. 23rd St., New York, N. Y.
Bernards Publishers Ltd., The Grampians, Western Gate, London W. 6, England.
Boyce-Roche Book Co., 460 Bloomfield Ave., Montclair, N. J.
Chapman & Hall Ltd., 37 Essex St., London, W. C. 2, England.
Day Co. Inc., John, 62 W. 45th St., New York, N. Y.
Dover Publications Inc., 1780 Broadway, New York, N. Y.
Editors and Engineers Ltd., Santa Barbara, Calif.
Electronics Research Publishing Co., Inc., 480 Canal St., New York 13, N. Y.
Elsevier Publishing Co., Inc., 215 Fourth Ave., New York, N. Y.
Engineers Council for Professional Development, 29 W. 39th St., New York, N. Y.
Federal Telephone & Radio Corp., Publication Dept., 67 Broad St., New York 4, N. Y.
Harper & Brothers, 49 E. 33rd St., New York, N. Y.
Industrial Research Service, Dover, N. H.
Institute of Radio Engineers, Inc., 1 E. 79th St., New York, N. Y.
International Publishers Co., 381 Fourth Ave., New York, N. Y.
Interscience Publishers Inc., 215 Fourth Ave., New York 3, N. Y.
Irwin Inc., Richard D., 3201 S. Michigan Ave., Chicago 16, Ill.
McGraw-Hill Book Company, Inc., 330 W. 42nd St., New York 18, N. Y.
Macmillan Co., The, 60 Fifth Ave., New York 11, N. Y.
Maedel Publishing House, 523 East 38th St., Brooklyn 3, N. Y.
Murray Hill Books Inc., 232 Madison Ave., New York, N. Y.
National Bureau of Standards, Washington, D. C.
Nelson & Sons, Thomas, 385 Madison Ave., New York, N. Y.
Oxford University Press, 114 Fifth Ave., New York, N. Y.
Philips Gloeilampenfabrieken, N. V., Eindhoven, The Netherlands.
Philosophical Library, Publishers, 15 E. 40th St., New York 16, N. Y.
Pitman Publishing Corp., 2 W. 45th St., New York, N. Y.
Prentice-Hall Inc., 70 Fifth Ave., New York, N. Y.
Princeton University Press, Princeton, N. J.
Radcraft Publications Inc., 25 W. Broadway, New York, N. Y.
Radio Corporation of America, R C A Laboratories Div., Princeton, N. J.
Radio Corporation of America, Tube Dept., Harrison, N. J.
Rider Publications Inc., John F., 480 Canal St., New York 13, N. Y.
Ronald Press Co., The, 15 E. 26th St., New York 10, N. Y.
Sams Co. Inc., Howard W., 2201 E. 46th St., Indianapolis 5, Ind.
Stechert-Hafner Inc., 31 East 10th St., New York, N. Y.
United Catalog Publishers Inc., 110 Lafayette St., New York, N. Y.
University Scientific Co. Inc., Vincennes, Ind.
University of Chicago Press, The, Chicago, Ill.
VanNostrand Co., Inc., D., 250 Fourth Ave., New York 3, N. Y.
Wiley & Sons Inc., John, 440 Fourth Ave., New York, N. Y.

TELEMETERING SYSTEMS—*Electronic*

ⓋAmpex Electric Corp., 1155 Howard Ave., San Carlos, Calif.
Applied Science Corp. of Princeton, The, P. O. Box 44, Princeton, N. J.
Arlington Electric Products Inc., 500 W. 52nd St., New York 19, N. Y.
ⓋAutomatic Temperature Control Co., Inc., 4212 Pulaski Ave., Philadelphia 44, Pa.
ⓋBailey Meter Co., 1044 Ivanhoe Rd., Cleveland 10, Ohio.
ⓋBendix Aviation Corp., Pacific Division, 11600 Sherman Way, North Hollywood, Calif.
ⓋClarke Instrument Corp., 910 King St., Silver Spring, Md.
ⓋControl Corp., 718 Central Ave., Minneapolis 14, Minn.
ⓋElectro-Mechanical Research, Inc., Ridgefield, Conn.
ⓋFLADER, INC., FREDERIC, North Tonawanda, N. Y. ADV. PG. 240.
ⓋFriez Instrument Div., Bendix Aviation Corp., Baltimore 4, Md.
ⓋGENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
ⓋLear, Inc., 110 Ionia Ave., NW., Grand Rapids 2, Mich.
ⓋLeopold & Stevens Instruments, Inc., 4445 N. E. Glisan St., Portland 13, Ore.
ⓋLynch Co., F. W., 191 2nd St., San Francisco, Calif.
ⓋMelpar Inc., 452 Swann Ave., Alexandria, Va.
ⓋPOTTER INSTRUMENT CO., INC., 115 Cutter Mill Rd., Great Neck, N. Y. ADV. PG. 204.
ⓋRosen Engineering Products, Inc., Raymond, 32nd & Walnut Sts., Philadelphia 4, Pa.
ⓋSERVO-TEK PRODUCTS CO., 4 Godwin Ave., Paterson 1, N. J. ADV. PG. 187.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Smuckler & Co., Inc., A. F., 202 Tillary St., Brooklyn 1, N. Y.
ⓋStancil-Hoffman Corp., 1016 N. Highland Ave., Hollywood 38, Calif.
ⓋStandard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
ⓋThompson & Associates, John E., 7210 S. Yates Ave., Chicago 49, Ill.

TELEPHONES—*Handsets*

ⓋAutomatic Electric Sales Corp., 1033 W. Van Buren St., Chicago 7, Ill.
ⓋAVIOMETER DIV. OF ROANWELL CORP., 662 Pacific St., Brooklyn 17, N. Y. ADV. PG. 66.
ⓋConnecticut Telephone & Electric Div., Great American Industries, 70 Brittania St., Meriden, Conn.
ⓋKellogg Switchboard & Supply Co., 6650 S. Cicero Ave., Chicago 38, Ill.
ⓋMurdock Mfg. Co., Wm. J., Chelsea, Mass.
ⓋNorth Electric Mfg. Co., 501 S. Market St., Galion, Ohio.
ⓋStandard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Telephonics Corp., Park Ave., Huntington, N. Y.
ⓋU. S. Instrument Corp., 409 Broad St., Summit, N. J.
ⓋWheeler Insulated Wire Co., Inc., 150 E. Aurora St., Waterbury 91, Conn.

TELEVISION MASKS

See Masks, Television

TELEVISION PROJECTION SCREENS

See Screens, Television Projection

TELEVISION SYSTEMS—*Industrial*

ⓋHace Television Corp., Green & Lawring Sts., South Hackensack, N. J.
ⓋDeil Television, 147 West 42nd St., New York 17, N. Y.
ⓋEaperiart Farnsworth Corp., Fort Wayne, Indiana.
ⓋGRAY RESEARCH & DEVELOPMENT CO., 16 Arbor St., Hartford 1, Conn. ADV. PG. 239.
ⓋHi-Par Products Co., Fitchburg, Mass.
Jamaica Television Mfg. Co., 95-26 Sutphin Blvd., Jamaica 4, N. Y.
ⓋMultiple Television Mfg. Co., 987 Hegeman Ave., Brooklyn 8, N. Y.
ⓋNorth American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
ⓋPhilco Corp., Tioga & C Sts., Philadelphia 34, Pa.
ⓋPolarad Electronics Corp., 100 Metropolitan Ave., Brooklyn 11, N. Y.
ⓋRADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
ⓋRemington Rand Inc., Vericon Dept., 315 4th Ave., New York, N. Y.
Telequip Radio Co., 1901 S. Wanstenaw, Chicago, Ill.
ⓋTeletronics Laboratory, Inc., 352 Maple Ave., Westbury, L. I., N. Y.
ⓋTelevision Equipment Corp., 248 William St., New York 7, N. Y.
Television Projects, Inc., 8440 Coral Way, Miami 34, Fla.
ⓋTelevision Utilities Corp., 1741 Broadway, New York 19, N. Y.

TERMINAL BLOCKS

ⓋAircraft Marine Products, Inc., 1523 N. Fourth St., Harrisburg, Pa.
ⓋALDEN PRODUCTS CO., 117 N. Main St., Brockton 64, Mass. ADV. PG. 235.

V indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

V AMERICAN LAVA CORP., Chattanooga 5, Tenn. ADV. PG. 31.

V AMERICAN PHENOLIC CORPORATION, 1830 S. 54th Ave., Chicago 50, Ill. ADV. PG. 191.

V Beer Co., N. S., 9 Montgomery St., Hillside, N. J.

V BUCHANAN ELECTRICAL PRODUCTS CORP., 1290 Central Ave., Hillside, N. J. ADV. PG. 214.

V Burke Electric Co., 12th & Cranberry Sts., Erie, Pa.

V Burndy Engineering Co., Inc., 107 Brackner Blvd., New York 59, N. Y.

V CAMBRIDGE THERMIONIC CORP., 445 Concord Ave., Cambridge, Mass. ADV. PG. 72.

V CINCH MFG. CORP., 1026 S. Homan Ave., Chicago 24, Ill. ADV. PG. 154.

V Cinema Engineering Co., 1510 W. Verdugo Ave., Burbank, Calif. ADV. PG. 184.

V Citation Products Co., 233 E. 146th St., New York 51, N. Y.

V Connecticut Telephone & Electric Div., Great American Industries, Inc., 70 Britannia St., Meriden, Conn.

V Continental-Diamond Fibre Co., 16 Chapel St., Newark 16, Del.

V Cole Electric Co., 2700 Southport Ave., Chicago 14, Ill.

Corbin Development & Mfg. Co., 1 N. Crawford Ave., Chicago 24, Ill.

Ely Inc., Hugh H., 4700 Stanton Ave., Philadelphia 44, Pa.

V Electrical Refractories Co., 60 Clark St., East Palestine, Ohio.

Electronic Mechanics Inc., 70 Clifton Blvd., Clifton, N. J.

V FEDERAL SCREW PRODUCTS INC., 224 W. Huron St., Chicago 10, Ill. ADV. PG. 271.

V FEDERAL TELEPHONE AND RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.

V Franklin Mfg. Corp., A. W., 43-20 34th St., Long Island City, N. Y.

V GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.

V GENERAL CERAMICS & STEATITE CORP., Keasbey, N. J. ADV. PG. 219.

V GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.

Greenfield Insulation Co., 51 W. 21st St., New York, N. Y.

Insulation Mfg. Co., 11 New York Ave., Brooklyn, N. Y.

V INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.

V JONES DIV., HOWARD B., Cinch Mfg. Corp., 1026 S. Homan Ave., Chicago 24, Ill. ADV. PG. 155.

V Keystone Electronics Co., 50-52 Franklin St., New York 13, N. Y.

V Kings Electronics Co., Inc., 811 Lexington Ave., Brooklyn 21, N. Y.

V Kulton Electric Mfg. Co., 123 New Jersey Railroad Ave., Newark 5, N. J.

V Kulka Electric Mfg. Co., Inc., 30 South St., Mt. Vernon, N. Y.

V Lamicoid Fabricators, Inc., 4845 W. Cortland St., Chicago 39, Ill.

Lorel Electronics Corp., 794 E. 140th St., New York 54, N. Y.

V MALCO TOOL & MFG. CO., 4025 W. Lake St., Chicago 24, Ill. ADV. PG. 234.

Masonite Corp., 111 W. Washington St., Chicago 2, Ill.

Micarta Fabricators, Inc., 5324 Ravenswood Ave., Chicago 40, Ill.

V Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.

V Miller Co., J. W., 5917 S. Main St., Los Angeles, Calif.

V Molded Insulation Co., Aircraft Control Div., 335 E. Price St., Philadelphia, Pa.

V NATIONAL VULCANIZED FIBRE CO., Wilmington, Del. ADV. PG. 183.

Penn Fibre & Specialty Co., 2020 E. Westmoreland St., Philadelphia 34, Pa.

V PRECISION METAL PRODUCTS CO. OF MALDEN, 342 Eastern Ave., Malden 48, Mass. ADV. PG. 220.

Printed Inc., 65 Mercer St., New York, N. Y.

V RICHARDSON CO., THE, 2767 Lake St., Melrose Park, Ill. ADV. PG. 144.

V Smith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.

Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.

States Co., 19 New Park Ave., Hartford 6, Conn.

V Taylor Fibre Co., Norristown, Pa.

V Triad Transformer Mfg. Co., 2254 Sepulveda Blvd., Los Angeles 64, Calif.

V U. S. Instrument Corp., 409 Broad St., Summit, N. J.

V Waste Electric Products Co., 211 Jacob St., Sturgis, Mich.

V WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 37.

TERMINAL BOARDS

V AEROLITE ELECTRONIC HARDWARE CORP., 507 26th St., Union City, N. J. ADV. PG. 148.

V ALDEN PRODUCTS CO., 117 N. Main St., Brockton 64, Mass. ADV. PG. 235.

American Communications Corp., 306 Broadway, New York 7, N. Y.

V AMERICAN PHENOLIC CORPORATION, 1830 S. 54th Ave., Chicago 50, Ill. ADV. PG. 191.

Ault & Co., Inc., 315 Throop Ave., Brooklyn 21, N. Y.

V Beer Co., N. S., 9 Montgomery St., Hillside, N. J.

Birdsall Radio Co., Inc., 145 Hudson St., New York 13, N. Y.

V BUCHANAN ELECTRICAL PRODUCTS CORP., 1290 Central Ave., Hillside, N. J. ADV. PG. 214.

V Burndy Engineering Co., Inc., 107 Brackner Blvd., New York 59, N. Y.

V CAMBRIDGE THERMIONIC CORP., 445 Concord Ave., Cambridge, Mass. ADV. PG. 72.

V CENTRALAB DIV. OF GLOBE UNION INC., 935 E. Keefe Ave., Milwaukee 1, Wis. ADV. PG. 64, 65.

V CINCH MFG. CORP., 1026 S. Homan Ave., Chicago 24, Ill. ADV. PG. 154.

V Citation Products Co., 233 E. 146th St., New York 51, N. Y.

V Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.

V Connecticut Telephone & Electric Div., Great American Industries, Inc., 70 Britannia St., Meriden, Conn.

Ely Inc., Hugh H., 4700 Stanton Ave., Philadelphia 44, Pa.

Electronic Mechanics Inc., 70 Clifton Blvd., Clifton, N. J.

V FEDERAL SCREW PRODUCTS INC., 224 W. Huron St., Chicago 10, Ill. ADV. PG. 271.

V FEDERAL TELEPHONE & RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.

V Franklin Mfg. Corp., A. W., 43-20 34th St., Long Island City, N. Y.

V GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.

V GENERAL CERAMICS & STEATITE CORP., Keasbey, N. J. ADV. PG. 219.

V GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.

Greenfield Insulation Co., 51 W. 21st St., New York, N. Y.

Insulation Mfg. Co., 11 New York Ave., Brooklyn, N. Y.

V INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.

V JONES DIV., HOWARD B., Cinch Mfg. Corp., 1026 S. Homan Ave., Chicago 24, Ill. ADV. PG. 155.

V Keystone Electronics Co., 50-52 Franklin St., New York 13, N. Y.

V Kings Electronics Co., Inc., 811 Lexington Ave., Brooklyn 21, N. Y.

V Kulton Electric Mfg. Co., 123 New Jersey Railroad Ave., Newark 5, N. J.

V Kulka Electric Mfg. Co., Inc., 30 South St., Mt. Vernon, N. Y.

V Lamicoid Fabricators, Inc., 4845 W. Cortland St., Chicago 39, Ill.

Lorel Electronics Corp., 794 E. 140th St., New York 54, N. Y.

V MALCO TOOL & MFG. CO., 4025 W. Lake St., Chicago 24, Ill. ADV. PG. 234.

Masonite Corp., 111 W. Washington St., Chicago 2, Ill.

Micarta Fabricators, Inc., 5324 Ravenswood Ave., Chicago 40, Ill.

V Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.

V Miller Co., J. W., 5917 S. Main St., Los Angeles, Calif.

V Molded Insulation Co., Aircraft Control Div., 335 E. Price St., Philadelphia, Pa.

V NATIONAL VULCANIZED FIBRE CO., Wilmington, Del. ADV. PG. 183.

Penn Fibre & Specialty Co., 2020 E. Westmoreland St., Philadelphia 34, Pa.

V PRECISION METAL PRODUCTS CO. OF MALDEN, 342 Eastern Ave., Malden 48, Mass. ADV. PG. 220.

Printed Inc., 65 Mercer St., New York, N. Y.

V RICHARDSON CO., THE, 2767 Lake St., Melrose Park, Ill. ADV. PG. 144.

V Smith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.

Standard Fibre Co., Inc., 313 Wheeler St., Tonawanda, N. Y.

States Co., 19 New Park Ave., Hartford 6, Conn.

V Taylor Fibre Co., Norristown, Pa.

V Thordarson Electric Mfg. Div., Maguire Industries, Inc., 500 W. Huron St., Chicago 10, Ill.

Tinnerman Inc., The, United-Carr Fastener Corp., 469 Waterman St., Newtonville, Mass.

V U. S. Engineering Co., 521 Commercial St., Glendale 3, Calif.

V Waste Electric Products Co., 211 Jacob St., Sturgis, Mich.

TERMINAL STRIPS

AEROLITE ELECTRONIC HARDWARE CORP., 507 26th St., Union City, N. J. ADV. PG. 148.

V ALDEN PRODUCTS CO., 117 N. Main St., Brockton 64, Mass. ADV. PG. 235.

American Communications Corp., 306 Broadway, New York 7, N. Y.

V AMERICAN PHENOLIC CORPORATION, 1830 S. 54th Ave., Chicago 50, Ill. ADV. PG. 191.

Ault & Co., Inc., 315 Throop Ave., Brooklyn 21, N. Y.

V Beer Co., N. S., 9 Montgomery St., Hillside, N. J.

Birdsall Radio Co., Inc., 145 Hudson St., New York 13, N. Y.

V BUCHANAN ELECTRICAL PRODUCTS CORP., 1290 Central Ave., Hillside, N. J. ADV. PG. 214.

V Burndy Engineering Co., Inc., 107 Brackner Blvd., New York 59, N. Y.

V CAMBRIDGE THERMIONIC CORP., 445 Concord Ave., Cambridge, Mass. ADV. PG. 72.

Cannon Electric Development Co., 3209 Humboldt St., Los Angeles 31, Calif.

V CINCH MFG. CORP., 1026 S. Homan Ave., Chicago 24, Ill. ADV. PG. 154.

V Citation Products Co., 233 E. 146th St., New York 51, N. Y.

V Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.

V Connecticut Telephone & Electric Div., Great American Industries, Inc., 70 Britannia St., Meriden, Conn.

V Cole Electric Co., 2700 Southport Ave., Chicago 14, Ill.

Electronic Mechanics, Inc., 70 Clifton Blvd., Clifton, N. J.

V FEDERAL SCREW PRODUCTS INC., 224 W. Huron St., Chicago 10, Ill. ADV. PG. 271.

V FEDERAL TELEPHONE AND RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.

V Franklin Mfg. Corp., A. W., 43-20 34th St., Long Island City, N. Y.

V GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.

V GENERAL CERAMICS & STEATITE CORP., Keasbey, N. J. ADV. PG. 219.

V GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.

Greenfield Insulation Co., 51 W. 21st St., New York, N. Y.

Insulation Mfg. Co., 11 New York Ave., Brooklyn, N. Y.

V INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.

V JONES DIV., HOWARD B., Cinch Mfg. Corp., 1026 S. Homan Ave., Chicago 24, Ill. ADV. PG. 155.

V Keystone Electronics Co., 50-52 Franklin St., New York 13, N. Y.

V Kings Electronics Co., Inc., 811 Lexington Ave., Brooklyn 21, N. Y.

V Kulton Electric Mfg. Co., 123 New Jersey Railroad Ave., Newark 5, N. J.

V Kulka Electric Mfg. Co., Inc., 30 South St., Mt. Vernon, N. Y.

V Lamicoid Fabricators, Inc., 4845 W. Cortland St., Chicago 39, Ill.

Lorel Electronics Corp., 794 E. 140th St., New York 54, N. Y.

V MALCO TOOL & MFG. CO., 4025 W. Lake St., Chicago 24, Ill. ADV. PG. 234.

Masonite Corp., 111 W. Washington St., Chicago 2, Ill.

Micarta Fabricators, Inc., 5324 Ravenswood Ave., Chicago 40, Ill.

V Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.

V Miller Co., J. W., 5917 S. Main St., Los Angeles, Calif.

V Molded Insulation Co., Aircraft Control Div., 335 E. Price St., Philadelphia, Pa.

V NATIONAL VULCANIZED FIBRE CO., Wilmington, Del. ADV. PG. 183.

Penn Fibre & Specialty Co., 2020 E. Westmoreland St., Philadelphia 34, Pa.

V Penn-Union Electric Corp., 315 State Street, Erie, Pa.

V Philmore Mfg. Co., 113 University Place, New York 3, N. Y.

V PRECISION METAL PRODUCTS CO. OF MALDEN, 342 Eastern Ave., Malden 48, Mass. ADV. PG. 220.

Printed Inc., 65 Mercer St., New York, N. Y.

V Remler Co., Ltd., 2101 Bryant St., San Francisco, Calif.

V RICHARDSON CO., THE, 2767 Lake St., Melrose Park, Ill. ADV. PG. 144.

V Servomechanisms, Inc., 142 Mineola Blvd., Mineola, N. Y.

V Smith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.

V Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.

States Co., 19 New Park Ave., Hartford 6, Conn.

V Taylor Fibre Co., Norristown, Pa.

V Thordarson Electric Mfg. Div., Maguire Industries, Inc., 500 W. Huron St., Chicago 10, Ill.

V U. S. Engineering Co., 521 Commercial St., Glendale 3, Calif.

V Vector Electronic Co., 1101 Riverside Drive, Los Angeles 31, Calif.

V Waste Electric Products Co., 211 Jacob St., Sturgis, Mich.

V Waterbury Companies Inc., Waterbury 90, Conn.

TERMINALS

V AEROLITE ELECTRONIC HARDWARE CORP., 507 26th St., Union City, N. J. ADV. PG. 148.

V Aircraft Marine Products Inc., 1528 N. Fourth St., Harrisburg, Pa.

V ALDEN PRODUCTS CO., 117 N. Main St., Brockton 64, Mass. ADV. PG. 235.

V Bead Chain Manufacturing Co., 110 Mountain Grove St., Bridgeport 5, Conn.

V Belden Mfg. Co., 4647 W. Van Buren St., Chicago 44, Ill.

V BUCHANAN ELECTRICAL PRODUCTS CORP., 1290 Central Ave., Hillside, N. J. ADV. PG. 214.

V Burndy Engineering Co., Inc., 107 Brackner Blvd., New York 59, N. Y.

V CAMBRIDGE THERMIONIC CORP., 445 Concord Ave., Cambridge, Mass. ADV. PG. 72.

V CINCH MFG. CORP., 1026 S. Homan Ave., Chicago 24, Ill. ADV. PG. 154.

V Citation Products Co., 233 E. 146th St., New York 51, N. Y.

V Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.

V Cook Electric Co., 2700 Southport Ave., Chicago 14, Ill.

V Corbin Electric Mfg. Co., Bantam, Conn.

V Eastern Specialty Co., Philadelphia 40, Pa.

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

ⓋFEDERAL SCREW PRODUCTS INC., 224 W. Huron St., Chicago 10, Ill. ADV. PG. 271.
ⓋFrankel Connector Co., 177 Hudson St., New York, N. Y.
ⓋFranklin Mfg. Corp., A. W., 43-20 34th St., Long Island City, N. Y.
ⓋGENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
ⓋGENERAL CERAMICS & STEATITE CORP., Keasbey, N. J. ADV. PG. 219.
ⓋGENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
ⓋGENERAL ELECTRIC CO., Construction Materials Dept., 1285 Boston Ave., Bridgeport 2, Conn. ADV. PG. 6 to 18.
ⓋGrammes & Sons, Inc., L. F., 389 Union St., Allentown 2, Pa.
ⓋHallett Mfg. Co., 1601 Florence Ave., Inglewood, Calif.
ⓋHEYMAN MFG. CO., 300 Michigan Ave., Kenilworth, N. J. ADV. PG. 26.
ⓋHoco Copper Tube & Products Inc., Marlemont Ave., Marlemont, Cincinnati 27, Ohio.
ⓋINSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
ⓋIsolantite Mfg. Corp., Stirling, N. J.
ⓋJohnson Co., E. F., Waseca, Minn.
ⓋKeystone Electronics Co., 50-52 Franklin St., New York 13, N. Y.
ⓋKulton Electric Mfg. Co., 123 New Jersey Railroad Ave., Newark 5, N. J.
ⓋKulka Electric Mfg. Co., Inc., 30 South St., Mt. Vernon, N. Y.
LaMaque Mfg. Co., Inc., East Rutherford, N. J.
ⓋLewis Engineering Co., 52 Rubber Ave., Naugatuck, Conn.
Local Electronics Corp., 294 E. 149th St., New York 54, N. Y.
ⓋLUNDEY ASSOCIATES, Mfg. Div., 694 Main St., Waltham 54, Mass. ADV. PG. 277.
ⓋMALCO TOOL & MFG. CO., 4925 W. Lake St., Chicago 24, Ill. ADV. PG. 244.
Micarta Fabricators, Inc., 5324 Ravenswood Ave., Chicago 40, Ill.
ⓋMiller Mfg. Co., James, 150 Exchange St., Malden, Mass.
ⓋMolded Insulation Co., Aircraft Control Div., 335 E. Price St., Philadelphia, Pa.
ⓋMOLDING CORP. OF AMERICA, Pawtucket, R. I. ADV. PG. 230.
ⓋMorse Co., Frank W., 1300 Soldiers Field Rd., Boston 35, Mass.
ⓋNational Screw & Mfg. Co., Cleveland 4, Ohio.
ⓋPATTON-MacGUYER CO., 17 Virginia Ave., Providence 5, R. I. ADV. PG. 138.
ⓋPRECISION METAL PRODUCTS CO. OF MALDEN, 342 Eastern Ave., Malden 48, Mass. ADV. PG. 220.
ⓋSt. Mary's Carbon Co., State Rd., St. Marys, Pa.
ⓋSchutt Co., Walter L., 9806 Santa Monica Blvd., Beverly Hills, Calif.
ⓋShakeproof Inc., Div. of Illinois Tool Wks., 2501 N. Keeler Ave., Chicago 39, Ill.
ⓋSherman Mfg. Co., H. B., 22 Barnes St., Battle Creek, Mich.
ⓋSmith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.
ⓋStimpson Co., Inc., Edwin B., 74 Franklin Ave., Brooklyn 5, N. Y.
ⓋThomas & Betts Co., Inc., 36 Butler St., Elizabeth, N. J.
ⓋThordarson Electric Mfg. Div., Maguire Industries, Inc., 500 W. Huron St., Chicago 10, Ill.
ⓋTriad Transformer Mfg. Co., 2254 Sepulveda Blvd., Los Angeles 64, Calif.
ⓋUnited Shoe Machinery Corp., 142 Federal St., Boston, Mass.
ⓋU. S. Engineering Co., 521 Commercial St., Glendale 3, Calif.
ⓋVaco Products Co., 317 E. Ontario St., Chicago 11, Ill.
ⓋWade Electric Products Co., 211 Jacob St., Sturgis, Mich.
ⓋWaterbury Companies, Inc., Waterbury 90, Conn.
Zierick Mfg. Corp., Beechwood & Rickdale Aves., New Rochelle, N. Y.

TERMINALS—*Hermetically Sealed*

Electronic Mechanics, Inc., 70 Clifton Blvd., Clifton, N. J.
ⓋFerrule Corp., Carthage at Hannaford, Cincinnati 12, Ohio.
ⓋGENERAL CERAMICS & STEATITE CORP., Keasbey, N. J. ADV. PG. 219.
ⓋHeldor Bushing & Terminal Co., Inc., P. O. Box 91, Orange, N. J.
HERMASEAL CO., INC., Riverside Drive, Elkhart, Ind. ADV. PG. 264.
ⓋIlco Industries, San Carlos, Calif.
ⓋLUNDEY ASSOCIATES, Mfg. Div., 694 Main St., Waltham 54, Mass. ADV. PG. 277.
ⓋMOLDING CORP. OF AMERICA, Pawtucket, R. I. ADV. PG. 230.
ⓋSTUPAKOFF CERAMIC & MFG. CO., Latrobe, Pa. ADV. PG. 147.
ⓋThordarson Electric Mfg. Div., Maguire Industries, Inc., 500 W. Huron St., Chicago 10, Ill.
ⓋTriad Transformer Mfg. Co., 2254 Sepulveda Blvd., Los Angeles 64, Calif.
ⓋVitroseal Corp., The, 918 Oak St., Wyoming, Cincinnati 15, Ohio.
ⓋWheaton Co., T. C., Industrial Division, 220 G Street, Millville, N. J.

TEST CHAMBERS

See Chambers, Test

TESTERS—*Automatic Tube and Set*

ⓋBUCK ENGINEERING CO., 37-41 Mercy St., Freehold, N. J. ADV. PG. 194.
Coastwise Electronics Corp., 130 N. Beaudry Ave., Los Angeles, Calif.
ⓋDayco Radio Corp., 915 Valley St., Dayton 4, Ohio.
ⓋFeiler Engineering Co., 1601 S. Federal St., Chicago 16, Ill.
Metropolitan Electronics & Instruments Co., 106 Fifth Ave., New York 11, N. Y.
ⓋPhilco Corp., Tioga & C Sts., Philadelphia 34, Pa.
ⓋRadio City Products Co., Inc., 152 W. 25th St., New York 1, N. Y.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
ⓋSimpson Electric Co., Div. American Gage & Machine Co., 5208 W. Kinzie St., Chicago 44, Ill.
ⓋStar Measurements Co., 442 East 166th St., New York 56, N. Y.
ⓋSupreme, Inc., Greenwood, Miss.
ⓋSYLVANIA ELECTRIC PRODUCTS INC., Emporium, Pa. ADV. PG. 286 to 290.
ⓋWESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

TESTERS—*Battery*

Eagle Electric Mfg. Co., Inc., 23-10 Bridge Plaza S., Long Island City, N. Y.
ⓋElectric Heat Control Co., 9123 Inman Ave., Cleveland 5, Ohio.
ⓋFeiler Engineering Co., 1601 S. Federal St., Chicago 16, Ill.
ⓋHEATH CO., Benton Harbor, Mich. ADV. PG. 279.
ⓋInternational Instruments, Inc., 331 East St., New Haven 11, Conn.
ⓋJ B T INSTRUMENTS, INC., 441 Chapel St., New Haven 8, Conn. ADV. PG. 261.
ⓋMcColpin-Christie Corp., 4922 S. Figueroa St., Los Angeles 37, Calif.
Metropolitan Electronics & Instruments Co., 106 Fifth Ave., New York 11, N. Y.
ⓋPacific Engineering Co., 1801 E. Seventh St., Los Angeles 21, Calif.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
ⓋSimpson Electric Co., Div. of American Gage & Machine Co., 5208 W. Kinzie St., Chicago 44, Ill.
ⓋSterling Mfg. Co., 9205 Detroit Ave., Cleveland 2, Ohio.
ⓋSupreme, Inc., Greenwood, Miss.
ⓋTriplett Electrical Instruments Co., 286 Harmon Rd., Bluffton, Ohio.
ⓋWESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.
ⓋWillard Storage Battery Co., 246 E. 131st St., Cleveland 1, Ohio.

TESTERS—*Capacitor*

ⓋAerovox Corp., 740 Belleville Ave., New Bedford, Mass.
Bradshaw Instruments Co., 348 Livingston St., Brooklyn 17, N. Y.
ⓋBROWN-ELECTRO MEASUREMENT CORP., 4637 SE Hawthorne Blvd., Portland 15, Ore. ADV. PG. 276.
ⓋClippard Instrument Laboratory, Inc., 1125 Bank St., Cincinnati 14, Ohio.
ⓋClough Brengle Co., 6014 N. Broadway, Chicago, Ill.
ⓋCORNELL-DUBILIER ELECTRIC CORP., South Plainfield, N. J. ADV. PG. 70.
ⓋElectric Heat Control Co., 9123 Inman Ave., Cleveland 5, Ohio.
ⓋFREED TRANSFORMER CO., INC., 1736 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 143.
ⓋHEATH CO., Benton Harbor, Mich. ADV. PG. 279.
ⓋIndustrial Instruments Inc., 17 Pullack Ave., Jersey City 5, N. J.
ⓋJackson Electrical Instrument Co., 16 S. Patterson Blvd., Dayton 1, Ohio.
ⓋKalbfell Labs., Inc., 1076 Murena Blvd., San Diego 10, Calif.
McMurdo Silver Co., Inc., 1240 Main St., Hartford 3, Conn.
Metropolitan Electronics & Instruments Co., 106 Fifth Ave., New York 11, N. Y.
ⓋRadio City Products Co., Inc., 152 W. 25th St., New York 1, N. Y.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
ⓋSimpson Electric Co., Div. of American Gage & Machine Co., 5208 W. Kinzie St., Chicago 44, Ill.
ⓋSprague Electric Co., North Adams, Mass.
ⓋTask Corp., Newark, Ohio.
ⓋWESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

TESTERS—*Circuit*

ⓋACME ELECTRIC CORP., 31 Water St., Cuba, N. Y. ADV. PG. 210.
ⓋBiddle Co., James G., 1316 Arch St., Philadelphia 7, Pa.
Bradshaw Instrument Co., 348 Livingston St., Brooklyn 17, N. Y.
ⓋCole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
ⓋCommunication Measurements Lab., Inc., 120 Greenwich St., New York, N. Y.
ⓋCORNELL-DUBILIER ELECTRIC CORP., South Plainfield, N. J. ADV. PG. 70.
ⓋElectronic Workshop, Inc., 351 Bleecker St., New York 14, N. Y.
ⓋFeiler Engineering Co., 1601 S. Federal St., Chicago 16, Ill.
ⓋFurdham Mfg. Co., 2220 Pearsall Ave., New York 67, N. Y.
ⓋGENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
GTS Molding Corp., 4600 W. Huron St., Chicago 44, Ill.
ⓋIndustrial Devices, Inc., 27 State Rd., Edgewater, N. J.
ⓋInstrument Laboratories, 315 W. Walton Place, Chicago 10, Ill.
ⓋJackson Electrical Instrument Co., 16 S. Patterson Blvd., Dayton 1, Ohio.
Metropolitan Electronics & Instruments Co., 106 Fifth Ave., New York 11, N. Y.
Meissner Mfg. Div., Maguire Industries, Inc., Mt. Carmel, Ill.
ⓋOak Ridge Products Mfg. Div. of Video Television, Inc., 219 E. 127th St., New York 35, N. Y.
ⓋPhilco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Precision Apparatus Co., Inc., 92-27 Horace Harding Blvd., Elmhurst, N. Y.
ⓋPrecision Electronics, 641 Milwaukee Ave., Chicago 22, Ill.
ⓋRadex Corp., 2076 N. Elston Ave., Chicago 14, Ill.
ⓋRadio City Products, Co., Inc., 152 W. 25th St., New York, N. Y.
ⓋReiner Electronics Co., 152 W. 25th Street, New York, N. Y.
ⓋRoller-Smith, Bethlehem, Pa.
ⓋSHALLCROSS MFG. CO., 10 Jackson Ave., Collingdale, Pa. ADV. PG. 221.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
ⓋSimpson Electric Co., Div. of American Gage & Machine Co., 5208 W. Kinzie St., Chicago 44, Ill.
ⓋStar Measurements Co., 442 E. 166th St., New York 56, N. Y.
ⓋSuperior Instruments Co., 337 Fulton St., New York 7, N. Y.
ⓋSupreme Inc., Greenwood, Miss.
ⓋWESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
ⓋWESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

TESTERS—*Coating Thickness*

American Instrument Co., 8030 Georgia Ave., Silver Spring, Md.
ⓋBransion Instruments, Inc., 438 Fairfield Ave., Stamford, Conn.
ⓋGardner Lab., Inc., Henry A., 4723 Elm St., Bethesda 14, Md.
ⓋMarconi Instruments, Ltd., 23 Beaver St., New York 4, N. Y.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
ⓋTracerlab, Inc., 130 High St., Boston 10, Mass.

TESTERS—*Coil*

ⓋBiddle Co., James G., 1316 Arch St., Philadelphia 7, Pa.
ⓋBROWN ELECTRO-MEASUREMENT CORP., 4637 SE Hawthorne Blvd., Portland 15, Ore. ADV. PG. 276.
ⓋClough Brengle Co., 6014 N. Broadway, Chicago, Ill.
ⓋElectric Heat Control Co., 9123 Inman Ave., Cleveland 5, Ohio.
ⓋFREED TRANSFORMER CO., INC., 1736 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 143.
GTS Molding Corp., 4600 W. Huron St., Chicago 44, Ill.
ⓋMaydu Brothers, Plainfield, N. J.
ⓋKaatron, Inc., Box 472, Huntington Beach, Calif.
ⓋPhotobell Company, 116 Nassau St., New York 7, N. Y.
ⓋRubicon Co., 3751 Ridge Ave., Philadelphia, Pa.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.

TESTERS—*Color Infra Red*

ⓋPRECISE MEASUREMENTS CO., 942 Kings Highway, Brooklyn 23, N. Y. ADV. PG. 250.

TESTERS—*Continuity*

ⓋCole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
ⓋCORNELL-DUBILIER ELECTRIC CORP., South Plainfield, N. J. ADV. PG. 70.

V indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

V ELECTRONIC DESIGNS INC., Irvington, N. Y. Ad... PG. 249.
V Feller Engineering Co., 1601 S. Federal St., Chicago, Ill.
V GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 223.
V GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Gits Molding Corp., 4600 W. Huron St., Chicago 44, Ill.
V Instrument Laboratories, 315 W. Walton Place, Chicago 10, Ill.
V Kurman Inc., Box 472, Huntington Beach, Calif.
V SHALLCROSS MFG. CO., 10 Jackson Ave., Collingdale, Pa. ADV. PG. 221.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
V Simpson Electric Co., Div. of American Gage & Machine Co., 5208 W. Kinzie St., Chicago 44, Ill.
V Superior Instruments Co., 227 Fulton St., New York 7, N. Y.
V Supreme Inc., Greenwood, Miss.

TESTERS—*Crystal Testing*

V Bassett Inc., Res., 107-11 N. W. 1st Ave., Fort Lauderdale, Fla.
V Berkshire Laboratories, P. O. Box 70, Concord, Mass.
V CLARKE CRYSTAL CO., 2 Farm Rd., Marlboro, Mass. ADV. PG. 210.
V ELECTRONIC MEASUREMENTS CO., Red Bank, N. J. ADV. PG. 139.
V KNIGHTS CO., JAMES, 151 S. Wells St., Sandwich, Ill. ADV. PG. 190.
Monitor Products Co., 815 Fremont Ave., So. Pasadena, Calif.
V PANORAMIC RADIO PRODUCTS, INC., 10 South Second Ave., Mt. Vernon, N. Y. ADV. PG. 270.
V Crystal Devices Inc., 11804½ E. Grand St., Elizabeth, N. J.
V SHALLCROSS MFG. CO., 10 Jackson Ave., Collingdale, Pa. ADV. PG. 221.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.

TESTERS—*Distortion*

V Audio Instrument Co., 1947 Broadway, New York 23, N. Y.
V BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Doolittle Radio, Inc., 741 S. Laumis Blvd., Chicago, Ill.
V FREED TRANSFORMER CO., INC., 1716 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 143.
V HEWLETT PACKARD CO., 395 Page Mill Rd., Palo Alto, Calif. ADV. PG. 68, 69.
V Hofmann Corp., C. L., 436 Blvd. of Allies, Pittsburgh, Pa.
V Marconi Instruments, Ltd., 23 Beaver St., New York 4, N. Y.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.

TESTERS—*Ink Penetration*

Radiation Inc., 4751 Ridge Ave., Philadelphia, Pa.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
V Tech Laboratories, Inc., Bergen & Edsall Blvds., Palisades Park, N. J.
V Thwing-Albert Instrument Co., 5551 Pulaski Avenue, Philadelphia 44, Pa.

TESTERS—*Insulation*

V ACME ELECTRIC CORP., 31 Water St., Cuba, N. Y. ADV. PG. 210.
V Associated Research Inc., 3758 W. Belmont, Chicago 18, Ill.
V DELTA ELECTRIC CORP., 1742 3rd Ave., New York 29, N. Y. ADV. PG. 171.
V Dietz Co., James G., 1316 Arch St., Philadelphia 7, Pa.
V Dole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Electronic Blasting Co., 148 Glenridge Ave., Montclair, N. J.
V FLADER INC., FREDERIC, North Tonawanda, N. Y. ADV. PG. 240.
V FREED TRANSFORMER CO., INC., 1716 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 143.
Holtzer Cabot, Div. of National Electric Co., Inc., 125 Amory St., Boston 19, Mass.
V Ideal Industries Inc., Park & Borden Avenues, Sycamore, Ill.
V Industrial Instruments Inc., 11 Pollock Ave., Jersey City 5, N. J.
V Lewis & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
V MEASUREMENTS CORP., Boonton, N. J. ADV. PG. 145.
V Mutual Company, 116 Nassau St., New York 7, N. Y.
V Radio City Products Co., Inc., 152 W. 25th St., New York 1, N. Y.
V RADIO FREQUENCY LABS., INC., Boonton 7, N. J. ADV. PG. 272.
V Reiner Electronics Co., 152 W. 25th St., New York, N. Y.
V Rubicon Co., 3751 Ridge Ave., Philadelphia, Pa.
V SHALLCROSS MFG. CO., 10 Jackson Ave., Collingdale, Pa. ADV. PG. 221.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Smith Co., Inc., Herman H., 27 Park Place, New York 7, N. Y.
V Tiek Corp., Newark, Ohio.
V WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 27.
V WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

TESTERS—*Meter*

V Booth Co., Arthur B., 4124 Beverly Blvd., Los Angeles 4, Calif.
V Dole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
V Feller Engineering Co., 1601 S. Federal St., Chicago 16, Ill.
V MARION ELECTRICAL INSTRUMENT CO., Manchester, N. H. ADV. PG. 130.
Metropolitan Electronics & Instruments Co., 106 Fifth Ave., New York 11, N. Y.
V Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
V Precision Electronics, 641 Milwaukee Ave., Chicago 22, Ill.
V Radio City Products Co., Inc., 152 W. 25th St., New York 1, N. Y.
V RAWSON ELECTRICAL INSTRUMENT CO., 111 Potter St., Cambridge 42, Mass. ADV. PG. 156.
V Reiner Electronics Co., 152 W. 25th St., New York, N. Y.
V Rubicon Co., 3751 Ridge Ave., Philadelphia, Pa.
V Sensitive Research Instrument Corp., 9 Elm Ave., Mt. Vernon, N. Y.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
V Simpson Electric Co., Div. of American Gage & Machine Co., 5208 W. Kinzie St., Chicago 44, Ill.
V WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

TESTER—*Microwave Radar Testing Equipment*

American Electroneering Co., 2112 S. LaBrea Ave., Los Angeles, Calif.
Bennett & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
V Bomac (Canada) Ltd., 301-303 Windsor St., Halifax, N. S., Canada.
Davies Laboratories, Inc., 4705 Queensbury Rd., Riverdale, Md.
V General Communication Co., 830 Commonwealth Ave., Boston 15, Mass.
V GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
V HEWLETT PACKARD CO., 395 Page Mill Rd., Palo Alto, Calif. ADV. PG. 68, 69.
V Lenz Laboratories, Inc., 360 Bleecker St., New York 14, N. Y.
V Litton Industries, San Carlos, Calif.
V Manufacturers Thread Grinding Inc., P. O. Box 66, Teterboro, N. J.
V Marconi Instruments, Ltd., 23 Beaver St., New York 4, N. Y.
V Microwave Equipment Co., Inc., North Caldwell, N. J.
V PANORAMIC RADIO PRODUCTS, INC., 10 South Second Ave., Mt. Vernon, N. Y. ADV. PG. 270.
V Philco Corp., Tioga and C Sts., Philadelphia 34, Pa.
V Packard Electronics Corp., 100 Metropolitan Ave., Brooklyn 11, N. Y.
V POLYTECHNIC RESEARCH & DEVELOPMENT CO., INC., 202 Tillary St., Brooklyn 1, N. Y. ADV. PG. 56, 57.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
V SPERRY GYROSCOPE CO., Div. of Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.
V Varian Associates, 99 Washington St., San Carlos, Calif.
V WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.
V Weinschel Instrument Co., 1440 Commercial St., East Weymouth 89, Mass.

TESTERS—*Moisture Detection*

V Associated Research, Inc., 3758 W. Belmont, Chicago 18, Ill.
V MEASUREMENTS CORP., Boonton, N. J. ADV. PG. 145.
V North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
V WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

TESTERS—*Radar Tube*

V Microwave Equipment Co., Inc., North Caldwell, N. J.
V POLYTECHNIC RESEARCH & DEVELOPMENT CO., INC., 202 Tillary St., Brooklyn 1, N. Y. ADV. PG. 56, 57.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
V Simpson Electric Co., Div. of American Gage & Machine Co., 5208 W. Kinzie St., Chicago 44, Ill.
V SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.

TESTERS—*Transconductance Tube*

Metropolitan Electronics & Instruments Co., 106 Fifth Ave., New York 11, N. Y.
V Philco Corp., Tioga and C Sts., Philadelphia 34, Pa.
Precision Apparatus Co., Inc., 92-27 Horace Harding Blvd., Elmhurst, N. Y.
V Radio City Products Co., Inc., 152 W. 25th St., New York 1, N. Y.
V Sensitive Research Instrument Corporation, 9 Elm Ave., Mt. Vernon, N. Y.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
V WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

TESTERS—*Voltage Neon*

V ACME ELECTRIC CORP., 31 Water St., Cuba, N. Y. ADV. PG. 210.
Aerolux Light Corp., 653 11th Ave., New York 19, N. Y.
V Dante Electric Mfg. Co., Bantam, Conn.
V Fordham Mfg. Co., 2220 Pearsall Ave., New York 67, N. Y.
V Fox Valley Instrument Co., Ingleside, Ill.
V Ideal Industries, Inc., Park & Borden Aves., Sycamore, Ill.
V Industrial Devices, Inc., 22 State Rd., Edgewater, N. J.
Metropolitan Electronics & Instruments Co., 106 Fifth Ave., New York 11, N. Y.
V Mineralac Electric Co., 25 N. Peoria St., Chicago, Ill.
V Nichols Products Co., Moorestown, N. J.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
V Superior Instruments Co., 227 Fulton St., New York 7, N. Y.
V WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

THERMISTORS

V Fenwal Inc., Ashland, Mass.
V Fritts Instrument Div., Bendix Aviation Corp., Baltimore 4, Md.
V GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
V GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
V KEYSTONE CARBON CO., INC., Saint Marys, Pa. ADV. PG. 42.
V North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
V RAYTHEON MFG. CO., Power Tube Div., Waltham 54, Mass. ADV. PG. 253.
V SERVO CORP. OF AMERICA, 2020 Jericho Turnpike, New Hyde Park, N. Y. ADV. PG. 269.
V Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
V STUPAKOFF CERAMIC & MFG. CO., Latrobe, Pa. ADV. PG. 147.

THERMOCOUPLES

V American Thermo Electric Co., 67 E. 8th St., New York 3, N. Y.
V Atlas Coil Winders, Inc., Stamford, Conn.
V Baker & Co., Inc., 113 Astor St., Newark 5, N. J.
V Bristol Co., The, Waterbury 20, Conn.
V Dole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
V Bomac (Canada) Ltd., 301-303 Windsor St., Halifax, N. S., Canada.
Dalbro Labs., 5960 Santa Monica Blvd., Los Angeles, Calif.
V Farrand Optical Co., Inc., Bronx Blvd. at 238th St., New York 66, N. Y.
V FIELD ELECTRICAL INSTRUMENT CO., 109 E. 184th St., New York 53, N. Y. ADV. PG. 204.
V Foxboro Co., The, Foxboro, Mass.
V General Controls Co., Glendale 1, Calif.
V GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
V Illinois Testing Labs., Inc., 420 N. LaSalle St., Chicago 10, Ill.
V J. B. T. INSTRUMENTS INC., 441 Chapel St., New Haven 8, Conn. ADV. PG. 261.
V Lewis Engineering Co., 52 Rubber Ave., Naugatuck, Conn.
V Manufacturers Engr. & Equip. Corp., Willow Grove, Pa.
V Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Roberts Aves., Philadelphia 44, Pa.

(V)Perkin-Elmer Corp., The, Glenbrook, Conn.
(V)RAWSON ELECTRICAL INSTRUMENT CO., 111 Potter St., Cambridge 42, Mass. ADV. PG. 156.
(V)Reeder & Co., Charles M., 171 Victor Ave., Detroit 3, Mich.
(V)Richards Co., Inc., Arklay S., 78 Winchester St., Newton Highlands 61, Mass.
(V)Sensitive Research Instrument Corporation, 9 Elm Ave., Mt. Vernon, N. Y.
(V)Simpson Electric Co., Div. of American Gage & Machine Co., 5208 W. Kinzie St., Chicago 44, Ill.
(V)Thwing-Albert Instrument Co., 5351 Pulaski Ave., Philadelphia 44, Pa.
(V)Uniform Tubes, Shurs Lane & Larviston St., Roxborough, Philadelphia, Pa.
(V)WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
(V)WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.
(V)Wheelco Instruments Co., 847 W. Harrison St., Chicago 7, Ill.

THERMOCOUPLES—*Pyrometric*

(V)Baker & Co., Inc., 113 Astor St., Newark 5, N. J.
(V)Bristol Co., The, Waterbury 20, Conn.
(V)Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Dallons Labs., 5066 Santa Monica Blvd., Los Angeles, Calif.
(V)Foxboro Co., The, Foxboro, Mass.
(V)GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
(V)Illinois Testing Labs., Inc., 420 N. LaSalle St., Chicago 10, Ill.
(V)Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
(V)Lewis Engineering Co., 52 Rubber Ave., Naugatuck, Conn.
(V)Meters, Inc., 915 Westfield Blvd., Indianapolis 20, Ind.
(V)Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Roberts Aves., Philadelphia 44, Pa.
(V)Reeder & Co., Charles M., 171 Victor Ave., Detroit 3, Mich.
(V)Richards Co., Inc., Arklay S., 78 Winchester St., Newton Highlands 61, Mass.
(V)Thwing-Albert Instrument Co., 5351 Pulaski Ave., Philadelphia 44, Pa.
(V)WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.
(V)Wheelco Instruments Co., 847 W. Harrison St., Chicago 7, Ill.

THERMOMETERS—*Platinum Contact*

Mack Electrical Devices, Inc., 43 Glenside Ave., Wyncote, Pa.
Nurnberg Thermometer Co., 4 Carey St., Boston 32, Mass.
(V)Thwing-Albert Instrument Co., 5351 Pulaski Ave., Philadelphia 44, Pa.

THERMOMETERS—*Resistance*

(V)Bailey Meter Co., 1044 Ivanhoe Rd., Cleveland 10, Ohio.
(V)Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
(V)EDISON, INC., THOMAS A., Instrument Div., West Orange, N. J. ADV. PG. 129.
Foster Research Lab., 1961 University Ave., Palo Alto, Calif.
(V)Foxboro Co., The, Foxboro, Mass.
(V)Illinois Testing Labs., Inc., 420 N. LaSalle St., Chicago 10, Ill.
(V)J. B. T. INSTRUMENTS, INC., 441 Chapel St., New Haven 8, Conn. ADV. PG. 261.
(V)Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
(V)Lewis Engineering Co., 52 Rubber Ave., Naugatuck, Conn.
(V)Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Roberts Aves., Philadelphia 44, Pa.
(V)Rogan Brothers Forest, Inc., 76 Massachusetts Ave., Cambridge 39, Mass.
(V)SHALLCROSS MFG. CO., 10 Jackson Ave., Collingdale, Pa. ADV. PG. 221.
(V)Simpson Electric Co., Div. of American Gage & Machine Co., 5208 W. Kinzie St., Chicago 44, Ill.
(V)Thwing-Albert Instrument Co., 5351 Pulaski Ave., Philadelphia 44, Pa.
(V)Trans-sonics, Inc., Bedford Airport, Bedford, Mass.
(V)WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.
(V)Wheelco Instruments Co., 847 W. Harrison St., Chicago 7, Ill.

THERMOPILES

(V)Atlas Coil Winders, Inc., Stamford, Conn.
Eppley Lab., Inc., The, Newport, R. I.
(V)FIELD ELECTRICAL INSTRUMENT CO., 109 E. 184th St., New York 53, N. Y. ADV. PG. 204.
(V)Illinois Testing Labs., Inc., 420 N. LaSalle St., Chicago 10, Ill.
(V)Litton Industries, San Carlos, Calif.
(V)Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Roberts Aves., Philadelphia 44, Pa.
(V)Perkin-Elmer Corp., The, Glenbrook, Conn.
(V)Reeder & Co., Charles M., 171 Victor Ave., Detroit 3, Mich.

THYRATRONS

See Tubes

TIMERS—*Automatic Cycle*

(V)Adams & Westlake Co., Michigan St., Elkhart, Ind.
(V)ATOMIC INSTRUMENT CO., 160 Charles St., Boston, Mass. ADV. PG. 218.
(V)Automatic Signal Division, 100 Regent St., East Norwalk, Conn.
(V)Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.
(V)Bristol Co., The, Waterbury 20, Conn.
(V)Coral Designs, Box 248, Forest Hills, N. Y.
(V)CRAMER CO., INC., R. W., Box 13, Centerbrook, Conn. ADV. PG. 208.
(V)Deitz Co., S. J., Box 65, W. Englewood, N. J.
(V)Eagle Signal Corp., Moline, Illinois.
(V)Gale, Dorothea Mechanisms, 37-61 85th St., Jackson Heights, L. I., N. Y.
(V)GENERAL CONTROL COMPANY, 1200 Soldiers Field Rd., Boston 34, Mass. ADV. PG. 149.
(V)General Controls Co., Glendale 1, Calif.
(V)GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
(V)HAYDON CO., A. W., The, 232 N. Elm St., Waterbury, Conn. ADV. PG. 236.
(V)HAYDON MFG. CO., INC., 584 E. Elm St., Torrington, Conn. ADV. PG. 102, 103.
(V)Industrial Electronics Co., Inc., Hanover, Mass.
(V)KURMAN ELECTRIC CO., INC., 35-18 37th St., Long Island City 1, N. Y. ADV. PG. 214.
(V)Lektra Laboratories, 30 E. 10th St., New York 3, N. Y.
Lumenite Electric Co., 407 S. Dearborn St., Chicago 5, Ill.
(V)Mallory & Co., Inc., P. R., 3029 E. Washington St., Indianapolis 6, Ind.
(V)Minneapolis-Honeywell Regulator Co., 2753 Fourth Ave. S., Minneapolis, Minn.
(V)Paragon Electric Co., Two Rivers, Wis.
(V)POTTER INSTRUMENT CO., INC., 115 Cutter Mill Rd., Great Neck, N. Y. ADV. PG. 204.
Robotron Corp., 5570 W. Chicago Blvd., Detroit 4, Mich.
(V)Struthers-Dunn, Inc., 150 N. 13th St., Philadelphia 7, Pa.
(V)Tork Clock Co., Inc., 1 Grove St., Mt. Vernon, N. Y.
(V)Wallace & Tiernan Products, Inc., Belleville 9, N. J.
(V)WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.
(V)Wilson & Co., G. C., 2 N. Passaic Ave., Chatham, N. J.
Zenith Electric Co., 152 W. Walton St., Chicago 10, Ill.

TIMERS—*Automatic Interval*

(V)Adams & Westlake Co., Michigan St., Elkhart, Ind.
(V)Airborne Electronics Co., Metropolitan Airport, Hangar No. 3, Van Nuys, Calif.
(V)Airectron, Inc., P. O. Box 151, Caldwell, N. J.
(V)ATOMIC INSTRUMENT CO., 160 Charles St., Boston, Mass. ADV. PG. 218.
(V)Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.
(V)Coral Designs, Box 248, Forest Hills, N. Y.
(V)CRAMER CO., INC., R. W., Box 13, Centerbrook, Conn. ADV. PG. 208.
(V)Deitz Co., S. J., Box 65, W. Englewood, N. J.
(V)Dimco-Gray Co., 207 E. Sixth St., Dayton, Ohio.
(V)Eagle Signal Corp., Moline, Ill.
(V)Gale, Dorothea Mechanisms, 37-61 85th St., Jackson Heights, L. I., N. Y.
(V)GENERAL CONTROL COMPANY, 1200 Soldiers Field Rd., Boston 34, Mass. ADV. PG. 149.
(V)General Controls Co., Glendale 1, Calif.
(V)GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
(V)General Electric X-Ray Corp., 4855 W. McGeoch Ave., Milwaukee, Wis.
(V)HAYDON CO., A. W., THE, 232 N. Elm St., Waterbury, Conn. ADV. PG. 236.
(V)HAYDON MFG. CO., INC., 584 E. Elm St., Torrington, Conn. ADV. PG. 102, 103.
(V)Industrial Electronics Co., Inc., Hanover, Mass.
(V)Industrial Timer Corp., 115 Edison Pl., Newark 5, N. J.
(V)Lektra Laboratories, 30 E. 10th St., New York 3, N. Y.
Lumenite Electric Co., 407 S. Dearborn St., Chicago 5, Ill.
(V)Mallory & Co., Inc., P. R., 3029 E. Washington St., Indianapolis 6, Ind.
(V)Marconi Instruments, Ltd., 23 Beaver St., New York 4, N. Y.
(V)Minneapolis-Honeywell Regulator Co., 2753 Fourth Ave. S., Minneapolis, Minn.
(V)Nucleonic Corp. of America, The, 497 Union St., Brooklyn 31, N. Y.
(V)Paragon Electric Co., Two Rivers, Wis.
Photoswitch, Inc., 77 Broadway, Cambridge 42, Mass.
(V)POTTER INSTRUMENT CO., INC., 115 Cutter Mill Rd., Great Neck, N. Y. ADV. PG. 204.
(V)Pratt & Whitney Div., Niles-Bement-Pond Co., West Hartford 1, Conn.
(V)Reliance Automatic Lighting Co., 1919 Mead St., Racine, Wis.
(V)Rhodes Inc., M. A., 30 Bartholomew Ave., Hartford, Conn.
Robotron Corp., 5570 W. Chicago Blvd., Detroit 4, Mich.
(V)Sheffield Instrument Corp., 2021 N. Lincoln St., Burbank, Calif.
(V)Struthers-Dunn, Inc., 150 N. 13th St., Philadelphia 7, Pa.
(V)TELECHRON INC., Homer Ave., Ashland, Mass. ADV. PG. 197.
(V)Tork Clock Co., Inc., 1 Grove St., Mt. Vernon, N. Y.
(V)Tracerlab, Inc., 130 High St., Boston 10, Mass.
(V)Wallace & Tiernan Products, Inc., Belleville 9, N. J.
(V)Walser Automatic Timer Corp., Graybar Building, New York, N. Y.
(V)WARD LEONARD ELECTRIC CO., 31 South St., Mt. Vernon, N. Y. ADV. PG. 51, 52.
(V)WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Zenith Electric Co., 152 W. Walton St., Chicago 10, Ill.

TIMERS—*Automatic Reset*

(V)Airectron, Inc., P. O. Box 151, Caldwell, N. J.
(V)ATOMIC INSTRUMENT CO., 160 Charles St., Boston, Mass. ADV. PG. 218.
(V)Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.
(V)Beverley Scientific Co., Richmond, Calif.
(V)Coral Designs, Box 248, Forest Hills, N. Y.
(V)CRAMER CO., INC., R. W., Box 13, Centerbrook, Conn. ADV. PG. 208.
(V)Cutler-Hammer, Inc., 411 N. 12th St., Milwaukee 1, Wis.
(V)Eagle Signal Corp., Moline, Illinois.
(V)GENERAL CONTROL COMPANY, 1200 Soldiers Field Rd., Boston 34, Mass. ADV. PG. 149.
(V)GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
(V)HAYDON CO., A. W., THE, 232 N. Elm St., Waterbury, Conn. ADV. PG. 236.
(V)HAYDON MFG. CO., INC., 584 E. Elm St., Torrington, Conn. ADV. PG. 102, 103.
(V)Industrial Electronics Co., Inc., Hanover, Mass.
(V)Industrial Timer Corp., 115 Edison Pl., Newark 5, N. J.
(V)KURMAN ELECTRIC CO., INC., 35-18 37th St., Long Island City 1, N. Y. ADV. PG. 214.
(V)Lektra Laboratories, 30 E. 10th St., New York 3, N. Y.
(V)Liebel-Flarsheim Co., 303 W. Third St., Cincinnati 2, Ohio.
Lumenite Electric Co., 407 S. Dearborn St., Chicago 5, Ill.
(V)Minneapolis-Honeywell Regulator Co., 2753 Fourth Avenue S., Minneapolis, Minn.
(V)Paragon Electric Co., Two Rivers, Wisconsin.
(V)POTTER INSTRUMENT CO., INC., 115 Cutter Mill Rd., Great Neck, N. Y. ADV. PG. 204.
(V)QUAKER CITY GEAR WORKS, 1908-32 N. Front St., Philadelphia 22, Pa. ADV. PG. 272.
Robotron Corp., 5570 W. Chicago Blvd., Detroit 4, Mich.
Smuckler & Co., Inc., A. F., 202 Tillary St., Brooklyn 1, N. Y.
(V)Special Instruments Laboratory, Inc., 1003 Highland Ave., Knoxville, Tenn.
(V)Struthers-Dunn, Inc., 150 N. 13th St., Philadelphia 7, Pa.
(V)Tech Laboratories, Inc., Bergen & Edsall Blvds., Palisades Park, N. J.
(V)WARD LEONARD ELECTRIC CO., 31 South St., Mt. Vernon, N. Y. ADV. PG. 51, 52.
(V)WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
(V)Wilson & Co., G. C., 2 N. Passaic Ave., Chatham, N. J.
Zenith Electric Co., 152 W. Walton St., Chicago 10, Ill.

TIMERS—*Hour Counting*

(V)Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.
(V)CRAMER CO., INC., R. W., Box 13, Centerbrook, Conn. ADV. PG. 208.
(V)GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
(V)Gorrell & Gorrell, Haworth, N. J.
Harshaw Scientific Div., of The Harshaw Chemical Co., 1945 E. 97th St., Cleveland 6, Ohio.
(V)HAYDON CO., A. W., THE, 232 N. Elm St., Waterbury, Conn. ADV. PG. 236.
(V)HAYDON MFG. CO., INC., 584 E. Elm St., Torrington, Conn. ADV. PG. 102, 103.
(V)Industrial Timer Corp., 115 Edison Pl., Newark 5, N. J.

(V) indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

Lumenite Electric Co., 407 S. Dearborn St., Chicago, Ill.
(V) National Instrument Co., 246 Walnut St., Newtonville 60, Mass.
(V) Sheffield Instrument Corp., 2021 N. Lincoln St., Burbank, Calif.
(V) Spencer Instruments Laboratory, Inc., 1085 Highland Ave., Knoxville, Tenn.
(V) WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Zenith Electric Co., 152 W. Walton St., Chicago 10, Ill.

TIMERS—*Impulse*

(V) ATOMIC INSTRUMENT CO., 160 Charles St., Boston, Mass. ADV. 218.
(V) Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.
(V) Berkeley Scientific Co., Richmond, Calif.
(V) Coral Designs, Box 248, Forest Hills, N. Y.
(V) CRAMER CO. INC., R. W., Box 13, Centerbrook, Conn. ADV. PG. 208.
(V) Eagle Signal Corp., Moline, Illinois.
(V) Gale Donithea Mechanisms, 37-61 85th St., Jackson Heights 1, L. I., N. Y.
(V) Gorrell & Gorrell, Haworth, N. J.
(V) HAYDON CO., A. W. THE, 232 N. Elm St., Waterbury, Conn. ADV. PG. 236.
(V) Industrial Electronics Co., Inc., Hanover, Mass.
(V) Industrial Timer Corp., 115 Edison Pl., Newark 5, N. J.
(V) Lectra Laboratories, 30 E. 10th St., New York 3, N. Y.
Lumenite Electric Co., 407 S. Dearborn St., Chicago 5, Ill.
(V) POTTER INSTRUMENT CO., INC., 115 Cutter Mill Rd., Great Neck, N. Y. ADV. PG. 204.
Smoker & Co., Inc., A. F., 202 Tillary St., Brooklyn 1, N. Y.
(V) Special Instruments Laboratory, Inc., 1085 Highland Ave., Knoxville, Tenn.
(V) Struthers-Dunn, Inc., 150 N. 13th St., Philadelphia 7, Pa.
(V) Tasker, Inc., 130 High St., Boston 10, Mass.
(V) Wilson & Tinnan Products, Inc., Hendrick N. J.
Zenith Electric Co., 152 W. Walton St., Chicago 10, Ill.

TIMERS—*Inertia*

(V) Struthers-Dunn, Inc., 150 N. 13th St., Philadelphia 7, Pa.

TIMERS—*Motor Operated*

(V) Allen-Bradley Co., 136 W. Greenfield Ave., Milwaukee 4, Wis.
(V) Ampto Corp., 4234 Lincoln Ave., Chicago 18, Ill.
(V) Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.
(V) CRAMER CO., INC., R. W., Box 13, Centerbrook, Conn. ADV. PG. 208.
(V) Eagle Signal Corp., Moline, Illinois.
(V) Gale Donithea Mechanisms, 37-61 85th St., Jackson Heights 1, L. I., N. Y.
(V) General Controls Co., Glendale 1, Calif.
(V) GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 16.
(V) Gorrell & Gorrell, Haworth, N. J.
(V) HAYDON CO., A. W., THE, 232 N. Elm St., Waterbury, Conn. ADV. PG. 236.
(V) HAYDON MFG. CO., INC., 584 E. Elm St., Torrington, Conn. ADV. PG. 102, 103.
(V) Industrial Electronics Co., Inc., Hanover, Mass.
(V) Industrial Timer Corp., 115 Edison Pl., Newark 5, N. J.
(V) KURMAN ELECTRIC CO., INC., 35-18 37th St., Long Island City 1, N. Y. ADV. PG. 214.
(V) Lectra Laboratories, 30 E. 10th St., New York 3, N. Y.
(V) Lehel Fürdelem Co., 301 W. Third St., Cincinnati 2, Ohio.
Lumenite Electric Co., 407 S. Dearborn St., Chicago 5, Ill.
(V) Paragon Electric Co., Two Rivers, Wisconsin.
(V) Price Electric Corp., Frederick, Md.
(V) Sheffield Instrument Corp., 2021 N. Lincoln St., Burbank, Calif.
(V) Special Instruments Laboratory, Inc., 1085 Highland Ave., Knoxville, Tenn.
(V) Standard Electric Time Co., The, 89 Logan St., Springfield, Mass.
(V) Struthers-Dunn, Inc., 150 N. 13th St., Philadelphia 7, Pa.
(V) TELECHRON INC., Homer Ave., Ashland, Mass. ADV. PG. 197.
(V) Tork Clock Co., Inc., 1 Grove St., Mt. Vernon, N. Y.
(V) Tuerk Lab., Inc., 130 High St., Boston 10, Mass.
(V) WARD LEONARD ELECTRIC CO., 31 South St., Mt. Vernon, N. Y. ADV. PG. 51, 52.
(V) WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Zenith Electric Co., 152 W. Walton St., Chicago 10, Ill.

TIMERS—*Multicontact*

(V) Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.
(V) CRAMER CO., INC., R. W., Box 13, Centerbrook, Conn. ADV. PG. 208.
(V) Eagle Signal Corp., Moline, Illinois.
(V) GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 16.
(V) HAYDON CO., A. W., THE, 232 N. Elm St., Waterbury, Conn. ADV. PG. 236.
(V) HAYDON MFG. CO., INC., 584 E. Elm St., Torrington, Conn. ADV. PG. 102, 103.
(V) Industrial Timer Corp., 115 Edison Pl., Newark 5, N. J.
(V) Lectra Laboratories, 30 E. 10th St., New York 3, N. Y.
Lumenite Electric Co., 407 S. Dearborn St., Chicago 5, Ill.
(V) Struthers-Dunn, Inc., 150 N. 13th St., Philadelphia 7, Pa.
(V) WARD LEONARD ELECTRIC CO., 31 South St., Mt. Vernon, N. Y. ADV. PG. 51, 52.
(V) WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Zenith Electric Co., 152 W. Walton St., Chicago 10, Ill.

TIMERS—*Percentage*

(V) Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.
(V) CRAMER CO., Inc., R. W., Box 13, Centerbrook, Conn. ADV. PG. 208.
(V) Eagle Signal Corp., Moline, Ill.
(V) HAYDON CO., A. W., THE, 232 N. Elm St., Waterbury, Conn. ADV. PG. 236.
Lumenite Electric Co., 407 S. Dearborn St., Chicago 5, Ill.
(V) Tuttle & Kift, 1823 N. Mukitar St., Chicago 39, Ill.
Zenith Electric Co., 152 W. Walton St., Chicago 10, Ill.

TIMERS—*Photoelectric*

(V) Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.
(V) Cutler-Hammer, Inc., 411 N. 12th St., Milwaukee, Wis.
(V) Kintz Co., S. J., Box 65, W. Englewood, N. J.
(V) GENERAL ELECTRIC CO., Apparatus Dept., Schenectady N. Y. ADV. PG. 5 to 16.
(V) Industrial Electronics Co., Inc., Hanover, Mass.
Lumenite Electric Co., 407 S. Dearborn St., Chicago, Ill.
(V) Photovolt Company, 11th Nassau St., New York 7, N. Y.
Photovolt Corp., 95 Madison Ave., New York 16, N. Y.
(V) POTTER INSTRUMENT CO., INC., 115 Cutter Mill Rd., Great Neck, N. Y. ADV. PG. 204.
Smoker & Co., Inc., A. F., 202 Tillary St., Brooklyn 1, N. Y.
(V) WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

TIMERS—*Sequence*

(V) Adams & Westlake Co., Michigan St., Elkhart, Ind.
(V) Ainsworth, Inc., P. O. Box 151, Caldwell, N. J.
(V) Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.
(V) Coral Designs, Box 248, Forest Hills, N. Y.
(V) CRAMER CO., INC., R. W., Box 13, Centerbrook, Conn. ADV. PG. 208.
(V) Cutler-Hammer, Inc., 411 N. 12th St., Milwaukee 1, Wis.
(V) Eagle Signal Corp., Moline, Illinois.
(V) Gale Donithea Mechanisms, 37-61 85th St., Jackson Heights 1, L. I., N. Y.
(V) GENERAL ELECTRIC CO., Apparatus Dept., Schenectady N. Y. ADV. PG. 5 to 16.
(V) Gorrell & Gorrell, Haworth, N. J.
(V) HAYDON CO., A. W., THE, 232 N. Elm St., Waterbury, Conn. ADV. PG. 236.
(V) HAYDON MFG. CO., INC., 584 E. Elm St., Torrington, Conn. ADV. PG. 102, 103.
(V) Industrial Timer Corp., 115 Edison Pl., Newark 5, N. J.
(V) Lectra Laboratories, 30 E. 10th St., New York 3, N. Y.
Lumenite Electric Co., 407 S. Dearborn St., Chicago 5, Ill.
(V) Minneapolis-Honeywell Regulator Co., 2753 Fourth Ave. S., Minneapolis, Minn.
(V) Paragon Electric Co., Two Rivers, Wisconsin.
(V) POTTER INSTRUMENT CO., INC., 115 Cutter Mill Rd., Great Neck, N. Y. ADV. PG. 204.
Robertson Corp., 5570 W. Chicago Blvd., Detroit 4, Mich.
Smoker & Co., Inc., A. F., 202 Tillary St., Brooklyn 1, N. Y.
(V) Struthers-Dunn, Inc., 150 N. 13th St., Philadelphia 7, Pa.
(V) Tork Clock Co., Inc., 1 Grove St., Mt. Vernon, N. Y.
(V) Tuttle Automatic Timer Corp., Grosbar Bldg., New York, N. Y.
Wertronic Co., 19500 West 8 Mile Rd., Detroit 19, Mich.
(V) WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
(V) Wilson & Co., G. C., 2 N. Passaic Ave., Chatham, N. J.
Zenith Electric Co., 152 W. Walton St., Chicago 10, Ill.

TIMERS—*Thermal*

(V) EDISON, INC., THOMAS A., Instrument Div., West Orange, N. J. ADV. PG. 129.
(V) General Controls Co., Glendale 1, Calif.
(V) GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 16.
(V) KURMAN ELECTRIC CO., INC., 35-18 37th St., Long Island City 1, N. Y. ADV. PG. 214.
(V) Minneapolis-Honeywell Regulator Co., 2753 Fourth Ave., S., Minneapolis, Minn.
(V) Spencer Thermostat Co., 34 Forest St., Attleboro, Mass.
(V) Standard Electrical Products Co., 402 E. 1st St., Dayton, Ohio.
(V) Struthers-Dunn, Inc., 150 N. 13th St., Philadelphia 7, Pa.
(V) Ulanet Co., George, 413 Market St., Newark 5, N. J.
(V) WARD LEONARD ELECTRIC CO., 31 South St., Mt. Vernon, N. Y. ADV. PG. 51, 52.

TIMERS—*Welding*

(V) Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.
(V) Clark Controller Co., 1146 E. 152nd St., Cleveland 10, Ohio.
(V) Coral Designs, Box 248, Forest Hills, N. Y.
(V) Cutler-Hammer, Inc., 411 No. 12th St., Milwaukee 1, Wis.
(V) Eisler Engineering Co., Inc., 740 S. 13th St., Newark 3, N. J.
(V) GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 16.
(V) Industrial Electronics Co., Inc., Hanover, Mass.
(V) Industrial Timer Corp., 115 Edison Pl., Newark 5, N. J.
Robertson Corp., 5570 W. Chicago Blvd., Detroit 4, Mich.
Wertronic Co., 19500 West 8 Mile Road, Detroit 19, Mich.
(V) WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
(V) Wilson & Co., G. C., 2 N. Passaic Ave., Chatham, N. J.

TITRATION APPARATUS

(V) Central Scientific Co., 1700 Irving Park Rd., Chicago 13, Ill.
(V) Consolidated Engineering Corp., 620 N. Lake Ave., Pasadena 4, Calif.
(V) Fischer Scientific Co., 717 Forbes St., Pittsburgh 19, Pa.
Harshaw Scientific Div. of The Harshaw Chemical Co., 1945 E. 97th St., Cleveland 6, Ohio.
(V) National Technical Laboratories, 820 Mission St., South Pasadena, Calif.
Photovolt Corp., 95 Madison Ave., New York 16, N. Y.

TOOLS—*Acetylene Soldering*

(V) Linde Air Products Co., Unit of Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y.

TOOLS—*Resistance Soldering*

(V) Ideal Industries, Inc., Park & Borden Avenues, Sycamore, Ill.
(V) Progressive Welder Co., 3050 E. Outer Drive, Detroit, Mich.
(V) Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.

TOOLS—*Small Insulated*

(V) AEROLITE ELECTRONIC HARDWARE CORP., 567 26th St., Union City, N. J. ADV. PG. 138.
(V) Bonney Forge & Tool Works, Allentown, Pa.
Brandywine Fibre Co., 15th & Poplar Sts., Wilmington, Del.
(V) Connecticut Hard Rubber Co., 407 East St., New Haven 9, Conn.
(V) GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
(V) J F D MFG. CO., 6101-23 Sixteenth Ave., Brooklyn, N. Y. ADV. PG. 264, 264.
(V) Keystone Electronics Co., 50-52 Franklin St., New York 13, N. Y.
(V) Park Metalware Co., 28 Bank St., Orchard Park, N. Y.
Phonograph Needle Mfg. Co., Inc., 42 Dudley St., Providence 5, R. I.
(V) Smith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.
(V) Stanley Works, The, New Britain, Conn.
(V) United Shoe Machinery Corp., 142 Federal St., Boston, Mass.
(V) Waterbury Companies, Inc., Waterbury 91, Conn.

TRACERS, RADIOACTIVE

See Isotopes

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

TRACERS—*Signal*

Coastwise Electronics Corp., 130 N. Beaudry Ave., Los Angeles, Calif.
Douglas Radio Labs., 40 Wayland St., Boston 25, Mass.
Ⓥ**ELECTRONIC INSTRUMENT CO., INC.**, 276 Newport St., Brooklyn 12, N. Y. ADV. PG. 274.
Ⓥ Feiler Engineering Co., 1601 S. Federal St., Chicago 16, Ill.
Ⓥ**HEATH CO.**, Benton Harbor, Mich. ADV. PG. 279.
McMurdo Silver Co., 1240 Main St., Hartford 3, Conn.
Ⓥ**MEASUREMENTS CORPORATION**, Boonton, N. J. ADV. PG. 145.
Meissner Mfg. Div., Maguire Industries, Inc., Mt. Carmel, Ill.
Ⓥ Oak Ridge Products Mfg. Div. of Video Television, Inc., 239 E. 127th St., New York 35, N. Y.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Radio City Products Co., Inc., 152 W. 25th St., New York 1, N. Y.
Ⓥ**RADIO CORP. OF AMERICA**, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
Ⓥ**RADIO FREQUENCY LABS., INC.**, Boonton 2, N. J. ADV. PG. 172.
Ⓥ Rainer Electronics Co., 152 W. 25th St., New York, N. Y.
Ⓥ Special Products Co., 9119 Brookville Rd., P. O. Box 471, Silver Spring, Maryland.

TRANSCEIVERS—*Aviation*

Ⓥ Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.
Ⓥ Collins Radio Co., Cedar Rapids, Iowa.
Ⓥ Consor (Canada), Ltd., 324-326 Windsor St., Halifax, N. S., Canada.
Ⓥ Lear, Inc., 110 Ionia Ave., N.W., Grand Rapids 2, Mich.
Ⓥ Mitchell Industries, Inc., Camp Wolters, Mineral Wells, Texas.
Radio Specialty Mfg. Co., 2023 S. E. Sixth Ave., Portland 14, Ore.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Smuckler & Co., Inc., A. F., 202 Tillary St., Brooklyn 1, N. Y.

TRANSCEIVERS—*Back-Pack*

Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.
Ⓥ Communications Co., Inc., 300 Greco Ave., Coral Gables 34, Fla.
Ⓥ Doolittle Radio, Inc., 7421 S. Loomis Blvd., Chicago 36, Ill.
Plastics & Electronics Co., 272 Northland Ave., Buffalo 8, N. Y.
Radio Specialty Mfg. Co., 2023 S. E. Sixth Ave., Portland 14, Ore.
Smuckler & Co., Inc., A. F., 202 Tillary St., Brooklyn 1, N. Y.

TRANSCEIVERS—*Hand-Pack*

Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.
Ⓥ Communications Co., Inc., 300 Greco Ave., Coral Gables 34, Fla.
Ⓥ Doolittle Radio, Inc., 7421 S. Loomis Blvd., Chicago 36, Ill.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Radio Specialty Mfg. Co., 2023 S. E. Sixth Ave., Portland 14, Ore.
Ⓥ Radio Transceiver Labs., 116-23 Jamaica Ave., Richmond Hill 18, N. Y.
Smuckler & Co., Inc., A. F., 202 Tillary St., Brooklyn 1, N. Y.

TRANSCEIVERS—*Lifeboat*

Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Radio Specialty Mfg. Co., 2023 S. E. Sixth Ave., Portland 14, Ore.
Smuckler & Co., Inc., A. F., 202 Tillary St., Brooklyn 1, N. Y.

TRANSCEIVERS—*uhf*

Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ Carnine & Bitter, 2332 Ontario Rd., NW., Washington 9, D. C.
Ⓥ Communications Co., Inc., 300 Greco Ave., Coral Gables 34, Fla.
Jamaica Television Mfg. Co., 95-26 Sutphin Blvd., Jamaica 4, N. Y.
Ⓥ Kaar Engineering Co., 2995 Middlefield Rd., Palo Alto, Calif.
Ⓥ RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
Smuckler & Co., Inc., A. F., 202 Tillary St., Brooklyn 1, N. Y.

TRANSCEIVERS—*vhf*

Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.
Ⓥ Collins Radio Co., Cedar Rapids, Iowa.
Ⓥ Communications Co., Inc., 300 Greco Ave., Coral Gables 34, Fla.
Ⓥ Doolittle Radio, Inc., 7421 S. Loomis Blvd., Chicago 36, Ill.
Jamaica Television Mfg. Co., 95-26 Sutphin Blvd., Jamaica 4, N. Y.
Ⓥ Kaar Engineering Co., 2995 Middlefield Rd., Palo Alto, Calif.
Ⓥ Lear, Inc., 110 Ionia Ave., N.W., Grand Rapids 2, Mich.
Ⓥ Mitchell Industries, Inc., Camp Wolters, Mineral Wells, Tex.
Ⓥ Philco Corp., Tioga and C Sts., Philadelphia 34, Pa.
Radio Specialty Mfg. Co., 2023 S.E. Sixth Ave., Portland 14, Ore.
Ⓥ RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
Smuckler & Co., Inc., A. F., 202 Tillary St., Brooklyn 1, N. Y.
Ⓥ Standard Telephones & Cables, Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Telephonics Corp., Park Ave., Huntington, N. Y.

TRANSDUCERS—*Ultrasonic*

Ⓥ BRUSH DEVELOPMENT CO., 3405 Perkins Ave., Cleveland 14, Ohio. ADV. PG. 124, 125.
Ⓥ Crystal Research Labs., Inc., 29 Allyn St., Hartford, Conn.
Ⓥ Edo Corp., College Point, Long Island, N. Y.
Ⓥ Massa Laboratories, 3868 Carnegie St., Cleveland, Ohio.
Ⓥ Piezo Products Co., Whitney St., Framingham, Mass.
Ⓥ RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
Ⓥ Submarine Signal Div., Raytheon Mfg. Co., Waltham, Mass.
Vivitone Electronics Co., 11660 Olympic Blvd., Los Angeles 25, Calif.

NOTE:

Throughout all transformer listings:
(h) indicates hermetically sealed types

TRANSFORMERS—*Audio*

Ⓥ ACME ELECTRIC CORP., 31 Water St., Cuba, N. Y. ADV. PG. 210. (h)
Ⓥ Acro Products Co., 5330 Baltimore Ave., Philadelphia, Pa. (h)
Ⓥ Acro Transformer Mfg. Corp., 21-20 33rd Ave., Long Island City, N. Y. (h)
Ⓥ Airdesign, Inc., 241 Fairfield Ave., Upper Darby, Pa. (h)
Ⓥ AIRPAX PRODUCTS CO., 1024 Greenmount Ave., Baltimore 2, Md. ADV. PG. 275. (h)
Ⓥ Altec Lansing Corp., 161 Avenue of the Americas, New York 13, N. Y. (h)
Ⓥ American Transformer Co., 285 Emmett St., Newark, N. J. (h)
Ⓥ Audio Development Co., 2833 13th Ave. S., Minneapolis 7, Minn. (h)
Ⓥ Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md. (h)
Ⓥ Best Mfg. Co., Inc., 1200 Grove St., Irvington 11, N. J. (h)
Ⓥ Bogen Co., Inc., David, 663 Broadway, New York 12, N. Y. (h)
Ⓥ CHICAGO TRANSFORMER DIV., Essex Wire Corp., 3501 W. Addison St., Chicago 18, Ill. ADV. PG. 225. (h)
Ⓥ Crest Transformer Corp., 1634-36 W. North Ave., Chicago 22, Ill. (h)
Ⓥ Clarkstan Corp., 11927 S.W. Pico Blvd., Los Angeles 64, Calif. (h)
Ⓥ Davis & Co., Dean W., Kentland, Ind. (h)
Ⓥ Delco Radio Div., General Motors Corp., Kokomo, Ind. (h)
Ⓥ Dinion Coil Co., Inc., Caledonia, N. Y. (h)
Ⓥ Electran Mfg. Co., 4596 Elston Ave., Chicago 30, Ill. (h)
Ⓥ Electrical Windings, Inc., 2015 N. Kolmar Ave., Chicago 39, Ill. (h)
Ⓥ Electro Engineering Works, 6021 College Ave., Oakland 18, Calif. (h)
Electronic Products Div., Epco Products, Inc., 2430 Atlantic Ave., Brooklyn 33, N. Y. (h)
Ⓥ ELECTRONIC TRANSFORMER CO., INC., 215 W. 25th St., New York, N. Y. ADV. PG. 116. (h)
Empire Coil Co., Inc., 238 Huguenot St., New Rochelle, N. Y. (h)
Ⓥ FERRANTI ELECTRIC, INC., 30 Rockefeller Plaza, New York 20, N. Y. ADV. PG. 81. (h)
Ⓥ Foster Transformer Co., Inc., 3820 Colerain Ave., Cincinnati 23, Ohio. (h)
Ⓥ FREED TRANSFORMER CO., INC., 1736 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 143. (h)
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
General Transformer Co., 18240 Harwood Ave., Homewood, Ill. (h)
Goslin Electric & Mfg. Co., 2921 W. Olive St., Burbank, Calif. (h)
Ⓥ Gramer Company, The, 2734 N. Pulaski Rd., Chicago 39, Ill.
Ⓥ Halldorson Company, The, 4500 Ravenswood Ave., Chicago 40, Ill.
Hartley Co., Ltd., H. A., 152 Hammersmith Rd., London W. 6, England.
Ⓥ HIGHLAND ENGINEERING CO., 32 Herman Blvd., Hicksville, N. Y. ADV. PG. 194. (h)
Inductive Equipment Co., Gettysburg, Pa.
Jefferson Electric Co., Bellwood, Ill.
Ⓥ JENSEN MFG. CO., 6601 S. Laramie Ave., Chicago 38, Ill. ADV. PG. 91.
K-Y Transformer Corp., 4414 Park Ave., New York 57, N. Y. (h)
Ⓥ KENYON TRANSFORMER CO., INC., 840 Barry St., New York 59, N. Y. ADV. PG. 135. (h)
Ⓥ Langevin Mfg. Corp., 37 W. 65th St., New York 23, N. Y. (h)
Ⓥ Lenkurt Electric Co., Inc., San Carlos, Calif. (h)
Ⓥ Magnetic Windings Div., Essex Wire Corp., Freemansburg Ave. & Hobson Blvd., Easton, Pa.
Ⓥ Malco Products, Inc., 22 E. Hennepen Ave., Minneapolis 1, Minn.
Ⓥ Merit Coil & Transformer Corp., 4427 N. Clark St., Chicago 40, Ill. (h)
Ⓥ NEW YORK TRANSFORMER CO., INC., Third Ave., Alpha, N. J. ADV. PG. 184. (h)
Peerless Electrical Products Co., 6920 McKinley Ave., Los Angeles 1, Calif.
Ⓥ Permaflux Corp., 4900 W. Grand Ave., Chicago 39, Ill.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Plummer Mfg. Co., 113 University Place, New York 3, N. Y.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
Radio-Music Corp., Port Chester, N. Y.
Radionic Transformer Co., 411 S. Sangamon St., Chicago 7, Ill.
Ⓥ RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
Ⓥ Red Arrow Electric Corp., 108 Cost St., Irvington 11, N. J. (h)
Ⓥ ROLA CO. INC., 2530 Superior Ave., Cleveland 14, Ohio. ADV. PG. 43. (h)
Ⓥ S. N. C. Mfg. Co., Inc., Box 277, Oshkosh, Wis.
Ⓥ Southwestern Industrial Electronic Co., 2831 Post Oak Rd., Houston 19, Tex. (h)
Ⓥ Standard Electrical Products Co., 402 E. 1st St., Dayton, Ohio. (h)
Ⓥ STANDARD TRANSFORMER CORP., Elston, Kedzie & Addison, Chicago 18, Ill. ADV. PG. 62. (h)
Ⓥ Super Electric Products Corp., 46 Oliver St., Newark, N. J. (h)
Ⓥ Tele-Video Corp., 241 Fairfield Ave., Upper Darby, Pa. (h)
Ⓥ Thermador Electric Mfg. Co., 5119 District Blvd., Los Angeles 22, Calif. (h)
Ⓥ Thordarson Electric Mfg. Div., Maguire Industries, Inc., 500 W. Huron St., Chicago 10, Ill. (h)
Ⓥ Transformer Engineers, 389 South Arroyo Parkway, Pasadena, Calif. (h)
Ⓥ Triad Transformer Mfg. Co., 2254 Sepulveda Blvd., Los Angeles, Calif. (h)
Ⓥ Union Electric Products Co., 24 Edison Pl., Newark 2, N. J.
Ⓥ UNITED TRANSFORMER CO., 150 Varick St., New York 13, N. Y. Inside Front Cover. (h)
Ⓥ UNIVERSITY LOUDSPEAKERS, INC., 80 Kensico Ave., White Plains, N. Y. ADV. PG. 231.
Utah Inc., F. Franklin St., Huntington, Ind. (h)
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Ⓥ Wheeler Insulated Wire Co., Inc., 150 E. Aurora St., Waterbury 91, Conn.

TRANSFORMERS—*Auto*

Ⓥ ACME ELECTRIC CORP., 31 Water St., Cuba, N. Y. ADV. PG. 210. (h)
Ⓥ Acro Products Co., 5330 Baltimore Ave., Philadelphia, Pa. (h)
Ⓥ Acro Transformer Mfg. Corp., 21-20 33rd Ave., Long Island City, N. Y. (h)
Ⓥ Airdesign, Inc., 241 Fairfield Ave., Upper Darby, Pa. (h)
Ⓥ AIRPAX PRODUCTS CO., 1024 Greenmount Ave., Baltimore 2, Md. ADV. PG. 275. (h)
Ⓥ Altec Lansing Corp., 161 Avenue of the Americas, New York 13, N. Y. (h)
Ⓥ American Transformer Co., 285 Emmett St., Newark, N. J. (h)
Ⓥ Audio Development Co., 2833 13th Ave. S., Minneapolis 7, Minn. (h)
Ⓥ Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md. (h)
Ⓥ CHICAGO TRANSFORMER DIV., Essex Wire Corp., 3501 W. Addison St., Chicago 18, Ill. ADV. PG. 225. (h)

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

Ⓥ Crest Transformer Corp., 1834-36 W. North Ave., Chicago 22, Ill. (h)
Ⓥ Davis & Co., Dean W., Kentland, Ind.
Ⓥ Dixon Coil Co., Inc., Caledonia, N. Y.
Ⓥ Dresser Electric Co., 942 E. Larned St., Detroit 7, Mich. (h)
Ⓥ Elcor Engineering Co., Inc., 740 S. 13th St., Newark 3, N. J.
Ⓥ Electran Mfg. Co., 4596 Elston Ave., Chicago 30, Ill. (h)
Ⓥ Electrical Windings, Inc., 2015 N. Kolmar Ave., Chicago 39, Ill. (h)
Electronic Transformer Co., Westerly Rd., Ossining, N. Y.
Ⓥ Electro Engineering Works, 6021 College Ave., Oakland 18, Calif. (h)
Ⓥ ELECTRONIC TRANSFORMER CO., INC., 215 W. 25th St., New York, N. Y. ADV. PG. 116. (h)
Ⓥ FERRANTI ELECTRIC, INC., 30 Rockefeller Plaza, New York 20, N. Y. ADV. PG. 81. (h)
Ⓥ Foster Transformer Co., Inc., 1930 Coleman Ave., Cincinnati 14, Ohio. (h)
Ⓥ FREED TRANSFORMER CO., INC., 1336 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 143. (h)
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18. (h)
Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49. (h)
Gonin Electric & Mfg. Co., 2921 W. Olive St., Burbank, Calif. (h)
Ⓥ Graham Company, The, 2734 N. Pulaski Rd., Chicago 39, Ill. (h)
Ⓥ Hall-Borton Company, The, 4500 Ravenswood Ave., Chicago 40, Ill. (h)
Ⓥ Hartzell Electric & Mfg. Co., Inc., 2500 Atlantic Ave., Brooklyn 7, N. Y. (h)
Ⓥ HIGHLAND ENGINEERING CO., 32 Holman Blvd., Hicksville, N. Y. ADV. PG. 194. (h)
Inductive Equipment Co., Gettysburg, Pa.
Ⓥ Jefferson Co., Bellaire, Ill. (h)
Ⓥ JENSEN MFG. CO., 6601 S. Laramie Ave., Chicago 38, Ill. ADV. PG. 91. (h)
Ⓥ K-V Transformer Corp., 4414 Park Ave., New York 57, N. Y. (h)
Ⓥ KENYON TRANSFORMER CO., INC., 840 Barry St., New York 59, N. Y. ADV. PG. 115. (h)
Ⓥ Langevin Mfg. Corp., 37 W. 65th St., New York 23, N. Y. (h)
Ⓥ Lenkurt Electric Co., San Carlos, Calif. (h)
Ⓥ Magnetic Windings Div., Essex Wire Corp., Freemansburg Ave. & Hobson Blvd., Easton, Pa. (h)
Metal Products, Inc., 22 E. Hennepin Ave., Minneapolis 1, Minn.
Ⓥ Merit Coil & Transformer Corp., 4427 N. Clark St., Chicago 40, Ill. (h)
Ⓥ Mid-Val, N. Y., P. O. Box 548, Trenton 4, N. J.
Ⓥ NEW YORK TRANSFORMER CO., INC., Third Ave., Alpha, N. J. ADV. PG. 184. (h)
Nothelfer Winding Labs., 9 Albemarle Ave., Trenton 5, N. J.
Ⓥ OPAD GREEN CO., 71 Warren St., New York 7, N. Y. ADV. PG. 274. (h)
Peerless Electrical Products Co., 6920 McKinley Ave., Los Angeles 1, Calif.
Ⓥ Pioneer Transformer Co., 431 S. Sangamon St., Chicago 7, Ill. (h)
Ⓥ RAYTHEON MFG. CO., Power Tube Div., Waltham 54, Mass. ADV. PG. 257. (h)
Red Arrow Electric Corp., 100 Colt St., Irvington, N. J. (h)
Ⓥ S. N. C. Mfg. Co., Box 277, Oshkosh, Wis. (h)
Ⓥ SORENSEN & CO., INC., 375 Fairfield Ave., Stamford, Conn. ADV. PG. 141. (h)
Ⓥ Standard Electrical Products Co., 402 E. 1st St., Dayton, Ohio. (h)
Ⓥ STANDARD TRANSFORMER CORP., Elston, Kedzie and Addison, Chicago 18, Ill. ADV. PG. 62. (h)
Ⓥ Super Electric Products Corp., 46 Oliver St., Newark, N. J. (h)
Ⓥ Tele-Video Corp., 241 Fairfield Ave., Upper Darby, Pa. (h)
Ⓥ Thermador Electric Mfg. Co., 5119 District Blvd., Los Angeles 22, Calif. (h)
Ⓥ Thordarson Electric Mfg. Div., Magnire Industries, Inc., 500 W. Huron St., Chicago 10, Ill. (h)
Ⓥ Triad Transformer Mfg. Co., 2254 Sepulveda Blvd., Los Angeles 64, Calif. (h)
Ⓥ Vision Electric Products Co., 74 Edison Pl., Newark 2, N. J.
Ⓥ UNITED TRANSFORMER CO., 150 Varick St., New York 13, N. Y. Inside Front Cover. (h)
Ⓥ Wagner Electric Corp., 6400 Plymouth Ave., St. Louis, Mo.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

TRANSFORMERS—*Blocking Oscillator*

Ⓥ Acro Transformer Mfg. Corp., 21-20 33rd Ave., Long Island City, N. Y. (h)
Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ CHICAGO TRANSFORMER DIV., Essex Wire Corp., 3501 W. Addison St., Chicago 18, Ill. ADV. PG. 225. (h)
Ⓥ COMMUNICATION ACCESSORIES CO., Box 345, 110th St. & Hillcrest Rd., Hickman Hills, Mo. ADV. PG. 178.
Ⓥ Crest Transformer Corp., 1834-36 W. North Ave., Chicago 22, Ill. (h)
Ⓥ Electro Engineering Works, 6021 College Ave., Oakland 18, Calif. (h)
Electronic Products Div., Epco Products, Inc., 2430 Atlantic Ave., Brooklyn 33, N. Y.
Ⓥ ELECTRONIC TRANSFORMER CO., INC., 215 W. 25th St., New York, N. Y. ADV. PG. 116. (h)
Empire Coil Co., Inc., 238 Huguenot St., New Rochelle, N. Y.
Ⓥ FERRANTI ELECTRIC, INC., 30 Rockefeller Plaza, New York 20, N. Y. ADV. PG. 81. (h)
Ⓥ FREED TRANSFORMER CO., INC., 1336 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 143. (h)
Gonin Electric & Mfg. Co., 2921 W. Olive St., Burbank, Calif. (h)
Ⓥ Graham Co., The, 2734 N. Pulaski Rd., Chicago 39, Ill. (h)
Ⓥ Hall-Borton Co., The, 4500 Ravenswood Ave., Chicago 40, Ill. (h)
Inductive Equipment Co., Gettysburg, Pa.
Ⓥ K-V Transformer Corp., 4414 Park Ave., New York 57, N. Y. (h)
Ⓥ Magnetic Windings Div., Essex Wire Corp., Freemansburg Ave. & Hobson Blvd., Easton, Pa. (h)
Ⓥ Merit Coil & Transformer Corp., 4427 N. Clark St., Chicago 40, Ill. (h)
Peerless Electrical Products Co., 6920 McKinley Ave., Los Angeles 1, Calif.
Ⓥ Photo Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Pilot Mfg. Co., 113 University Place, New York 3, N. Y.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75. Inside Back and Back Covers.
Ⓥ RAYTHEON MFG. CO., Power Tube Div., Waltham 54, Mass. ADV. PG. 257. (h)
Ⓥ ROLA CO., INC., THE, 2540 Superior Ave., Cleveland 14, Ohio. ADV. PG. 45. (h)
Ⓥ S. N. C. Mfg. Co., Inc., Box 277, Oshkosh, Wis. (h)
Sickles Co., F. W., P. O. Box 350, Chicopee, Mass.
Ⓥ STANDARD COIL PRODUCTS CO., 2179 N. Pulaski Rd., Chicago 39, Ill. ADV. PG. 233.
Ⓥ Standard Electrical Products Co., 402 E. 1st St., Dayton, Ohio. (h)
Ⓥ STANDARD TRANSFORMER CORP., Elston, Kedzie & Addison, Chicago 18, Ill. ADV. PG. 62. (h)
Ⓥ Super Electric Products Corp., 46 Oliver St., Newark, N. J. (h)
Ⓥ Telectron Co., The, 4019 Prospect Ave., Cleveland 3, Ohio.
Ⓥ Tele-Video Corp., 241 Fairfield Ave., Upper Darby, Pa. (h)
Ⓥ Thordarson Electric Mfg. Div., Magnire Industries, Inc., 500 W. Huron St., Chicago 10, Ill. (h)
Ⓥ Transformer Engineers, 369 S. Arroyo Pkway., Pasadena, Calif. (h)
Ⓥ Triad Transformer Mfg. Co., 2254 Sepulveda Blvd., Los Angeles 64, Calif. (h)
Ⓥ UNITED TRANSFORMER CO., 150 Varick St., New York 13, N. Y. ADV. PG. Inside Front Cover. (h)
Ⓥ Utah, Inc., E. Franklin St., Huntington, Ind.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Ⓥ Wheeler Insulated Wire Co., Inc., 150 E. Aurora St., Waterbury 91, Conn.

TRANSMORMERS—*Current*

Ⓥ ACME ELECTRIC CORP., 31 Water St., Cuba, N. Y. ADV. PG. 210.
Ⓥ Altec Lansing Corp., 161 Avenue of the Americas, New York 13, N. Y. (h)
Anets Co., R. D., 1101 N. Delaware St., Indianapolis, Ind.
Ⓥ Associated Research, Inc., 3758 W. Belmont, Chicago 18, Ill.
Ⓥ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ COMMUNICATION ACCESSORIES CO., Box 345, 110th St. & Hillcrest Rd., Hickman Hills, Missouri. ADV. PG. 178.
Ⓥ Davis & Co., Dean W., Kentland, Ind.
Ⓥ Dresser Electric Co., 942 E. Larned St., Detroit 7, Mich. (h)
Ⓥ Electran Mfg. Co., 4596 Elston Ave., Chicago 30, Ill. (h)
Ⓥ Electro Engineering Works, 6021 College Ave., Oakland 18, Calif. (h)
Ⓥ ELECTRONIC TRANSFORMER CO., INC., 215 W. 25th St., New York, N. Y. ADV. PG. 116. (h)
Ⓥ Easterline-Angus Co., Inc., P. O. Box 596, Indianapolis 6, Ind.
Ⓥ Ittner Mfg. Co., Inc., Woods Church Rd., Flemington, N. J.
Ⓥ FREED TRANSFORMER CO., INC., 1336 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 143. (h)
Ⓥ Gravure Labs., Inc., 2 East End Ave., New York 21, N. Y.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18. (h)
Ⓥ HIGHLAND ENGINEERING CO., 32 Holman Blvd., Hicksville, N. Y. ADV. PG. 194. (h)
Inductive Equipment Co., Gettysburg, Pa.
Ⓥ INSTRUMENT ELECTRONICS, 42-17 A. Douglaston Pkway., Douglaston, L. I., N. Y. ADV. PG. 260.
Ⓥ Instrument Laboratories, 315 W. Walton Place, Chicago 10, Ill.
Ⓥ Johnson Co., E. F., Waseca, Minn.
Ⓥ Kahon Electric Mfg. Co., 123 New Jersey Railroad Ave., Newark 5, N. J.
Ⓥ Lenkurt Electric Co., Inc., San Carlos, Calif. (h)
Ⓥ Miller Co., B. F., P. O. Box 568, Trenton 4, N. J.
Ⓥ Nothelfer Winding Labs., 9 Albemarle Ave., Trenton 5, N. J.
Peerless Electrical Products Co., 6920 McKinley Ave., Los Angeles 1, Calif.
Ⓥ RAYTHEON MFG. CO., Power Tube Div., Waltham 54, Mass. ADV. PG. 257. (h)
Ⓥ S. N. C. Mfg. Co., Inc., Box 277, Oshkosh, Wis. (h)
Ⓥ Standard Electrical Products Co., 402 E. 1st St., Dayton, Ohio. (h)
Ⓥ Stolle Engineering & Mfg. Co., 3970 S. Grand Ave., Los Angeles 37, Calif.
Ⓥ Thordarson Electric Mfg. Div., Maguire Industries, Inc., 500 W. Huron St., Chicago 10, Ill. (h)
Ⓥ UNITED TRANSFORMER CO., 150 Varick St., New York 13, N. Y. ADV. PG. Inside Front Cover. (h)
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

TRANSFORMERS—*Discriminator*

Acro Transformer Mfg. Corp., 21-20 33rd Ave., Long Island City, N. Y.
Ⓥ Automatic Mfg. Corp., 65 Gouverneur St., Newark 4, N. J.
Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ BURNELL & CO., 45 Warburton Ave., Yonkers 2, N. Y. ADV. PG. 59.
Ⓥ COMMUNICATION ACCESSORIES CO., Box 345, 110th St. & Hillcrest Rd., Hickman Hills, Mo. ADV. PG. 178.
Ⓥ Doolittle Radio, Inc., 7421 S. Loomis Blvd., Chicago 36.
Ⓥ ELECTRONIC TRANSFORMER CO., INC., 215 W. 25th St., New York, N. Y. ADV. PG. 116. (h)
Ⓥ FREED TRANSFORMER CO., INC., 1336 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 143. (h)
Ⓥ HARNETT ELECTRIC CORP., 138 Haven Ave., Port Washington, L. I., N. Y. ADV. PG. 182.
Ⓥ HIGHLAND ENGINEERING CO., 32 Holman Blvd., Hicksville, N. Y. ADV. PG. 194. (h)
Ⓥ HILLBURN ELECTRONIC PRODUCTS CO., 55 Nassau Ave., Brooklyn 22, N. Y. ADV. PG. 46.
Ⓥ Lenkurt Electric Co., Inc., San Carlos, Calif. (h)
Ⓥ Magnetic Windings Div., Essex Wire Corp., Freemansburg Ave., & Hobson Blvd., Easton, Pa. (h)
Ⓥ Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.
Ⓥ NATIONAL CO., INC., 61 Sherman St., Malden 48, Mass. ADV. PG. 33 to 36.
Peerless Electrical Products Co., 6920 McKinley Ave., Los Angeles 1, Calif.
Ⓥ Photo Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ STANDARD COIL PRODUCTS CO., 2179 N. Pulaski Rd., Chicago 39, Ill. ADV. PG. 233.
Ⓥ Standard Electrical Products Co., 402 E. 1st St., Dayton, Ohio. (h)
Ⓥ Stolle Engineering & Mfg. Co., 3970 S. Grand Ave., Los Angeles 37, Calif.
Ⓥ Super Electric Products Corp., 46 Oliver St., Newark, N. J. (h)
Ⓥ Teleradio Engineering Corp., 99 Wall St., New York 5, N. Y.
Ⓥ Thordarson Electric Mfg. Div., Maguire Industries, Inc., 500 W. Huron St., Chicago 10, Ill. (h)
Ⓥ U. S. ELECTRONICS CORP., 270 Warren St., Lyndhurst, N. J. ADV. PG. 256.
Ⓥ UNITED TRANSFORMER CO., 150 Varick St., New York 13, N. Y. ADV. PG. Inside Front Cover. (h)

TRANSFORMERS—*Impedance Matching*

Ⓥ ACME ELECTRIC CORP., 31 Water St., Cuba, N. Y. ADV. PG. 210.
Ⓥ Acro Products Co., 5330 Baltimore Ave., Philadelphia, Pa. (h)
Ⓥ Acro Transformer Mfg. Corp., 21-20 33rd Ave., Long Island City, N. Y. (h)
Ⓥ Aingesign, Inc., 241 Fairfield Ave., Upper Darby, Pa. (h)
Ⓥ Altec Lansing Corp., 161 Avenue of the Americas, New York 13, N. Y.
Ⓥ Audio Development Co., 2833 13th Ave. S., Minneapolis 7, Minn. (h)
Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ CHICAGO TRANSFORMER DIV., Essex Wire Corp., 3501 W. Addison St., Chicago 18, Ill. ADV. PG. 225. (h)
Ⓥ Cinaudagraph Speakers, Inc., Div. of Alcoa Mfg. Corp., 1401 Fairfax Trafficway, Kansas City, Kan.
Ⓥ COMMUNICATION ACCESSORIES CO., Box 345, 110th St. and Hillcrest Rd., Hickman Hills, Mo. ADV. PG. 178.
Ⓥ Communication Products Co., Inc., Broadway and Clark St., Keyport, N. J.
Ⓥ Crest Transformer Corp., 1834-36 North Ave., Chicago 22, Ill. (h)
Ⓥ Davis & Co., Dean W., Kentland, Ind.
Ⓥ Electran Mfg. Co., 4596 Elston Ave., Chicago 30, Ill. (h)

V Electrical Windings, Inc., 2615 N. Kolmar Ave., Chicago 39, Ill. (h)
V Electro Engineering Works, 6021 College Ave., Oakland 18, Calif. (h)
V ELECTRONIC TRANSFORMER CO., INC., 215 W. 25th St., New York, N. Y. ADV. PG. 116. (h)
V FERRANTI ELECTRIC, INC., 30 Rockefeller Plaza, New York 20, N. Y. ADV. PG. 81. (h)
V FREED TRANSFORMER CO., INC., 1736 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 143. (h)
Goslin Electric & Mfg. Co., 2921 W. Olive St., Burbank, Calif. (h)
V Gramer Co., The, 2734 N. Pulaski Rd., Chicago 39, Ill. (h)
V Halldorson Co., The, 4500 Ravenswood Ave., Chicago 40, Ill. (h)
V HIGHLAND ENGINEERING CO., 32 Holman Blvd., Hicksville, N. Y. ADV. PG. 194. (h)
Inductive Equipment Co., Gettysburg, Pa. (h)
V JENSEN MFG. CO., 6601 S. Laramie Ave., Chicago 38, Ill. ADV. PG. 91. (h)
V K-V Transformer Corp., 4414 Park Ave., New York 57, N. Y. (h)
V Langevin Mfg. Corp., 37 W. 65th St., New York 23, N. Y. (h)
V Lenkurt Electric Co., Inc., San Carlos, Calif. (h)
Leonard Electric Products Co., Inc., 1562 61st St., Brooklyn 19, N. Y. (h)
V Lummer Engineers, Inc., 1721 Delancy St., Philadelphia 3, Pa. (h)
V Magnetic Windings Div., Essex Wire Corp., Freemansburg Ave. & Hobson Blvd., Easton, Pa. (h)
V Merit Coil & Transformer Corp., 4427 N. Clark St., Chicago 40, Ill. (h)
V NATIONAL CO., INC., 61 Sherman St., Malden 48, Mass. ADV. PG. 33 to 36. (h)
V NEW YORK TRANSFORMER CO., INC., Third Ave., Alpha, N. J. ADV. PG. 184. (h)
V Newcomb Audio Products Co., 6824 Lexington Ave., Hollywood 38, Calif. (h)
Oxford Electric Corp., 3911 S. Michigan Ave., Chicago 15, Ill. (h)
Peerless Electrical Products Co., 6920 McKinley Ave., Los Angeles 1, Calif. (h)
V POLYTECHNIC RESEARCH & DEVELOPMENT CO., INC., 202 Tillary St., Brooklyn 1, N. Y. ADV. PG. 56, 57. (h)
Product Development Co., Inc., Arlington, N. J. (h)
Radio Music Corp., Port Chester, N. Y. (h)
V Red Arrow Electric Corp., 100 Colt St., Irvington 11, N. J. (h)
V ROLA CO., INC., THE, 2530 Superior Ave., Cleveland 14, Ohio. ADV. PG. 43. (h)
V S. N. C. Mfg. Co., Inc., Box 277, Oshkosh, Wis. (h)
V Standard Electrical Products Co., 402 E. 1st St., Dayton, Ohio. (h)
V STANDARD TRANSFORMER CORP., Elston, Kedzie and Addison, Chicago 18, Ill. ADV. PG. 62. (h)
V Tele-Video Corp., 241 Fairfield Ave., Upper Darby, Pa. (h)
V Thermador Electric Mfg. Co., 5119 District Blvd., Los Angeles 22, Calif. (h)
V Thordarson Electric Mfg. Div., Maguire Industries, Inc., 500 W. Huron St., Chicago 10, Ill. (h)
V Transformer Engineers, 364 S. Arroyo Parkway, Pasadena, Calif. (h)
V Triad Transformer Mfg. Co., 2254 Sepulveda Blvd., Los Angeles 64, Calif. (h)
V Union Electric Products Co., 24 Edison Pl., Newark 2, N. J. (h)
V UNITED TRANSFORMER CO., 150 Varick St., New York 13, N. Y. ADV. PG. Inside Front Cover. (h)
V UNIVERSITY LOUDSPEAKERS, INC., 80 S. Kensico Ave., White Plains, N. Y. ADV. PG. 231. (h)
Utah, Inc., E. Franklin St., Huntington, Ind. (h)
V Workshop Associates, Inc., 66 Needham St., Newton Highlands 61, Mass. (h)

TRANSFORMERS—*Instrument*

V Acro Products Co., 5330 Baltimore Ave., Philadelphia, Pa. (h)
V Airdesign, Inc., 241 Fairfield Ave., Upper Darby, Pa. (h)
Arnco Co., R. B., 1101 N. Delaware St., Indianapolis, Ind. (h)
V Associated Research, Inc., 3758 W. Belmont, Chicago 18. (h)
V BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169. (h)
V Burlington Instrument Co., Burlington, Iowa. (h)
V Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif. (h)
V COMMUNICATION ACCESSORIES CO., Box 345, 110th St. and Hillcrest Rd., Hickman Hills, Mo. ADV. PG. 178. (h)
V Crest Transformer Corp., 1834-36 W. North Ave., Chicago 22, Ill. (h)
V Davis & Co., Dean W., Kentland, Ind. (h)
V Dinion Coil Co., Inc., Caledonia, N. Y. (h)
V Dresser Electric Co., 942 E. Larned St., Detroit 7, Mich. (h)
V Electran Mfg. Co., 4596 Elston Ave., Chicago 30, Ill. (h)
V Electro Engineering Works, 6021 College Ave., Oakland 18, Calif. (h)
V ELECTRONIC TRANSFORMER CO., INC., 215 W. 25th St., New York, N. Y. ADV. PG. 116. (h)
V Esterline-Angus Co., Inc., P. O. Box 596, Indianapolis, Ind. (h)
V FREED TRANSFORMER CO., INC., 1736 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 143. (h)
V GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18. (h)
V Halldorson Co., The, 4500 Ravenswood Ave., Chicago 40, Ill. (h)
V HIGHLAND ENGINEERING CO., 32 Holman Blvd., Hicksville, N. Y. ADV. PG. 194. (h)
Inductive Equipment Co., Gettysburg, Pa. (h)
V Instrument Laboratories, 315 W. Walton Place, Chicago 10, Ill. (h)
V K-V Transformer Corp., 4414 Park Ave., New York 57, N. Y. (h)
V Lenkurt Electric Co., Inc., San Carlos, Calif. (h)
V Magnetic Windings Div., Esses Wire Corp., Freemansburg Ave. & Hobson Blvd., Easton, Pa. (h)
Northern Communications Mfg. Corp., 210 E. 40th St., New York 16, N. Y. (h)
Peerless Electrical Products Co., 6920 McKinley Ave., Los Angeles 1, Calif. (h)
V S. N. C. Mfg. Co., Inc., Box 277, Oshkosh, Wis. (h)
V SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86. (h)
V Standard Electrical Products Co., 402 E. 1st St., Dayton, Ohio. (h)
V Thermador Electric Mfg. Co., 5119 District Blvd., Los Angeles 22, Calif. (h)
V Thordarson Electric Mfg. Div., Maguire Industries, Inc., 500 W. Huron St., Chicago 10, Ill. (h)
V UNITED TRANSFORMER CO., 150 Varick St., New York 13, N. Y. ADV. PG. Inside Front Cover. (h)
V WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77. (h)
V WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 109. (h)

TRANSFORMERS—*Microphone*

V ACME ELECTRIC CORP., 31 Water St., Cuba, N. Y. ADV. PG. 210. (h)
V Acro Transformer Mfg. Corp., 21-20 33rd Ave., Long Island City, N. Y. (h)
V Airdesign, Inc., 241 Fairfield Ave., Upper Darby, Pa. (h)
V AIRPAX PRODUCTS CO., 1024 Greenmount Ave., Baltimore 2, Md. ADV. PG. 275. (h)
V Altec Lansing Corp., 161 Avenue of the Americas, New York 13, N. Y. (h)
V American Transformer Co., 285 Emmet St., Newark, N. J. (h)
V Audio Development Co., 2833 13th Ave. S., Minneapolis 7, Minn. (h)
V Crest Transformer Corp., 1834-36 W. North Ave., Chicago 22, Ill. (h)
V Davis & Co., Dean W., Kentland, Ind. (h)
V Dinion Coil Co., Inc., Caledonia, N. Y. (h)
V Electrical Windings, Inc., 2615 N. Kolmar Ave., Chicago 39, Ill. (h)
V ELECTRONIC TRANSFORMER CO., INC., 215 W. 25th St., New York, N. Y. ADV. PG. 116. (h)
V FERRANTI ELECTRIC, INC., 30 Rockefeller Plaza, New York 20, N. Y. ADV. PG. 81. (h)
V Foster Transformer Co., Inc., 3820 Colerain Ave., Cincinnati 23, Ohio. (h)
V FREED TRANSFORMER CO., INC., 1736 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 143. (h)
Goslin Electric & Mfg. Co., 2921 W. Olive St., Burbank, Calif. (h)
V Gramer Co., The, 2734 N. Pulaski Rd., Chicago 39, Ill. (h)
V Halldorson Company, The, 4500 Ravenswood Ave., Chicago 40, Ill. (h)
V HIGHLAND ENGINEERING CO., 32 Holman Blvd., Hicksville, N. Y. ADV. PG. 194. (h)
Inductive Equipment Co., Gettysburg, Pa. (h)
V K-V Transformer Corp., 4414 Park Ave., New York 57, N. Y. (h)
V KENYON TRANSFORMER CO., INC., 840 Barry St., New York 59, N. Y. ADV. PG. 135. (h)
V Langevin Mfg. Corp., 37 W. 65th St., New York 23, N. Y. (h)
V Lenkurt Electric Co., Inc., San Carlos, Calif. (h)
V Magnetic Windings Div., Essex Wire Corp., Freemansburg Ave. & Hobson Blvd., Easton, Pa. (h)
V Merit Coil & Transformer Corp., 4427 N. Clark St., Chicago 40, Ill. (h)
Peerless Electrical Products Co., 6920 McKinley Ave., Los Angeles 1, Calif. (h)
V S. N. C. Mfg. Co., Inc., Box 277, Oshkosh, Wis. (h)
V SHURE BROTHERS, INC., 225 W. Huron St., Chicago 10, Ill. ADV. PG. 19. (h)
V STANDARD TRANSFORMER CORP., Elston, Keedzie and Addison, Chicago 18, Ill. ADV. PG. 62. (h)
V Stolle Engineering & Manufacturing Co., 3970 S. Grand Ave., Los Angeles 37, Calif. (h)
V Super Electric Products Corp., 46 Oliver St., Newark, N. J. (h)
V Tele-Video Corp., 241 Fairfield Ave., Upper Darby, Pa. (h)
V Thordarson Electric Mfg. Div., Maguire Industries, Inc., 500 W. Huron St., Chicago 10, Ill. (h)
V Triad Transformer Mfg. Co., 2254 Sepulveda Blvd., Los Angeles 64, Calif. (h)
V Union Electric Products Co., 24 Edison Place, Newark 2, N. J. (h)
V UNITED TRANSFORMER CO., 150 Varick St., New York 13, N. Y. Inside Front Cover. (h)
V Wheeler Insulated Wire Co., Inc., 150 E. Aurora St., Waterbury 91, Conn. (h)

TRANSFORMERS—*Microwave*

V ACME ELECTRIC CORP., 31 Water St., Cuba, N. Y. ADV. PG. 210. (h)
V Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md. (h)
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y. (h)
V FREED TRANSFORMER CO., INC., 1736 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 143. (h)
Goslin Electric & Mfg. Co., 2921 W. Olive St., Burbank, Calif. (h)
V HIGHLAND ENGINEERING CO., 32 Holman Blvd., Hicksville, N. Y. ADV. PG. 194. (h)
Inductive Equipment Co., Gettysburg, Pa. (h)
V K-V Transformer Corp., 4414 Pake Ave., New York 57, N. Y. (h)
V Microwave Equipment Co., Inc., North Caldwell, N. J. (h)
Peerless Electrical Products Co., 6920 McKinley Ave., Los Angeles 1, Calif. (h)
V Philco Corp., Tioga & C Sts., Philadelphia 34, Pa. (h)
V POLYTECHNIC RESEARCH & DEVELOPMENT CO., INC., 202 Tillary St., Brooklyn 1, N. Y. ADV. PG. 56, 57. (h)
V Product Development Co., Inc., Arlington, N. J. (h)
V RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257. (h)
V SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86. (h)
V Technicraft Laboratories, Inc., Thomaston-Waterbury Rd., Thomaston, Conn. (h)
V Varian Associates, 99 Washington St., San Carlos, Calif. (h)
VECTRON, INC., 235 High St., Waltham, Mass. ADV. PG. 266. (h)
V Weymouth Instrument Co., 1440 Commercial St., East Weymouth 89, Mass. (h)

TRANSFORMERS—*Miniature*

V A. P. W. Co., 72 W. Main St., Rockaway, N. J. (h)
V Acro Products Co., 5330 Baltimore Ave., Philadelphia, Pa. (h)
V Acru Transformer Mfg. Corp., 21-20 33rd Ave., Long Island City, N. Y. (h)
V Airdesign, Inc., 241 Fairfield Ave., Upper Darby, Pa. (h)
V AIRPAX PRODUCTS CO., 1024 Greenmount Ave., Baltimore 2, Md. ADV. PG. 275. (h)
V Altec Lansing Corp., 161 Avenue of the Americas, New York 13, N. Y. (h)
V American Transformer Co., 285 Emmet St., Newark, N. J. (h)
V Audio Development Co., 2833 13th Ave. S., Minneapolis 7, Minn. (h)
V BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169. (h)
V Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md. (h)
V COMMUNICATION ACCESSORIES CO., Box 345, 110th St. and Hillcrest Rd., Hickman Hills, Missouri. ADV. PG. 178. (h)
V Crest Transformer Corp., 1834-36 W. North Ave., Chicago 22, Ill. (h)
V ELECTRONIC TRANSFORMER CO., INC., 215 W. 25th St., New York N. Y. ADV. PG. 116. (h)
V FERRANTI ELECTRIC, INC., 30 Rockefeller Plaza, New York 20, N. Y. ADV. PG. 81. (h)
V FREED TRANSFORMER CO. INC., 1736 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 143. (h)
V GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18. (h)
Goslin Electric & Mfg. Co., 2921 W. Olive St., Burbank, Calif. (h)
V HIGHLAND ENGINEERING CO., 32 Holman Blvd., Hicksville, N. Y. ADV. PG. 194. (h)
Inductive Equipment Co., Gettysburg, Pa. (h)
V K-V Transformer Corp., 4414 Park Ave., New York 57, N. Y. (h)
V KENYON TRANSFORMER CO., INC., 840 Barry St., New York 59, N. Y. ADV. PG. 135. (h)
V Lenkurt Electric Co., Inc., San Carlos, Calif. (h)
V Magnetic Windings Div., Essex Wire Corp., Freemansburg Ave. & Hobson Blvd., Easton, Pa. (h)
Peerless Electrical Products Co., 6920 McKinley Ave., Los Angeles 1, Calif. (h)
V Permoflux Corp., 4900 W. Grand Ave., Chicago 39, Ill. (h)
V Raytheon MFG. CO., Power Tube Div., Waltham 54, Mass. ADV. PG. 257. (h)
V S. N. C. Mfg. Co., Inc., Box 277, Oshkosh, Wis. (h)
V Sonotone Corp., P. O. Box 200, Saw Mill River Rd., Elmsford, N. Y. (h)
V Southwestern Industrial Electronic Co., 2851 Post Oak Rd., Houston 19, Texas. (h)
V Standard Electrical Products Co., 402 E. 1st St., Dayton, Ohio. (h)
V STANDARD TRANSFORMER CORP., Elston, Kedzie and Addison, Chicago 18, Ill. ADV. PG. 62. (h)
V Stolle Engineering & Mfg. Co., 3970 S. Grand Ave., Los Angeles 37, Calif. (h)

1950-1951 DIRECTORY of

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

Ⓥ Super Electric Products Corp., 46 Oliver St., Newark, N. J. (h)
Ⓥ Tele-Video Corp., 241 Fairfield Ave., Upper Darby, Pa. (h)
Ⓥ Thermador Electric Mfg. Co., 5119 District Blvd., Los Angeles 22, Calif. (h)
Ⓥ Thordarson Electric Mfg. Div., Maguire Industries, Inc., 500 W. Huron St., Chicago 10, Ill. (h)
Ⓥ Transformer Engineers, 389 S. Arroyo Parkway, Pasadena, Calif. (h)
Ⓥ Triad Transformer Mfg. Co., 2254 Sepulveda Blvd., Los Angeles 64, Calif. (h)
Ⓥ Union Electric Products Co., 24 Edison Pl., Newark 2, N. J. (h)
Ⓥ UNITED TRANSFORMER CO., 150 Varick St., New York 13, N. Y. Inside Front Cover. (h)
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

TRANSFORMERS—*Plug-in*

Ⓥ ACME ELECTRIC CORP., 31 Water St., Cuba, N. Y. Adv. Pg. 210. (h)
Ⓥ Acro Transformer Mfg. Corp., 21-20 33rd Ave., Long Island City, N. Y. (h)
Ⓥ Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md. (h)
Ⓥ Davis & Co., Dean W., Kentland, Ind. (h)
Ⓥ Electrical Transformer Co., Westerly Rd., Dayville, N. Y. (h)
Ⓥ Electron Mfg. Co., 4596 Elston Ave., Chicago 30, Ill. (h)
Ⓥ ELECTRONIC TRANSFORMER CO., INC., 215 W. 25th St., New York, N. Y. ADV. PG. 116. (h)
Ⓥ FREED TRANSFORMER CO., INC., 1736 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 143. (h)
Ⓥ HIGHLAND ENGINEERING CO., 32 Holman Blvd., Hicksville, N. Y. ADV. Pg. 194. (h)
Industrial Equipment Co., Gettysburg, Pa. (h)
Ⓥ K-V Transformer Corp., 4414 Park Ave., New York 57, N. Y. (h)
Ⓥ KENYON TRANSFORMER CO., INC., 840 Barry St., New York 59, N. Y. ADV. PG. 135. (h)
Ⓥ Lenkurt Electric Co., Inc., San Carlos, Calif. (h)
Ⓥ Magnetic Windings Div., Essex Wire Corp., Freemansburg Ave. & Hobson Blvd., Easton, Pa. (h)
Ⓥ NATIONAL CO., INC., 61 Sherman St., Malden 48, Mass. ADV. PG. 33 & 36. (h)
Ⓥ Newcomb Audio Products Co., 6824 Lexington Ave., Hollywood 38, Calif. (h)
Peerless Electrical Products Co., 6920 McKinley Ave., Los Angeles 1, Calif. (h)
Ⓥ Red Arrow Electric Corp., 100 Colt St., Irvington 11, N. J. (h)
Ⓥ S. N. C. Mfg. Co., Inc., Box 277, Oshkosh, Wis. (h)
Ⓥ Schwendler Industrial Electronic Co., 2831 Port Oak St., Houston 19, Tex. (h)
Ⓥ Super Electric Products Corp., 46 Oliver St., Newark 5, N. J. (h)
Ⓥ Thermador Electric Mfg. Co., 5119 District Blvd., Los Angeles 22, Calif. (h)
Ⓥ Thordarson Electric Mfg. Div., Maguire Industries, Inc., 500 W. Huron St., Chicago 10, Ill. (h)
Ⓥ Triad Transformer Mfg. Co., 2254 Sepulveda Blvd., Los Angeles 64, Calif. (h)
Ⓥ UNITED TRANSFORMER CO., 150 Varick St., New York 13, N. Y. ADV. PG. Inside Front Cover. (h)

TRANSFORMERS—*Power*

Ⓥ ACME ELECTRIC CORP., 31 Water St., Cuba, N. Y. ADV. PG. 210. (h)
Ⓥ Acro Products Co., 5330 Baltimore Ave., Philadelphia, Pa. (h)
Ⓥ Acro Transformer Mfg. Corp., 21-20 33rd Ave., Long Island City, N. Y. (h)
Ⓥ Airdesign, Inc., 241 Fairfield Ave., Upper Darby, Pa. (h)
Ⓥ AIRPAX PRODUCTS CO., 1024 Greenmount Ave., Baltimore 2, Md. ADV. PG. 275. (h)
Ⓥ Allen Lansing Corp., 161 Avenue of the Americas, New York 13, N. Y. (h)
Ⓥ AMERICAN TELEVISION & RADIO CO., 300 E. Fourth St., St. Paul 1, Minn. ADV. PG. 175. (h)
Ⓥ American Transformer Co., 265 Emmett St., Newark, N. J. (h)
Ⓥ Audio Development Co., 2833 13th Ave. S., Minneapolis 7, Minn. (h)
Ⓥ Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md. (h)
Bittermann Electric Co., Box 664, Canaan, Conn. (h)
Ⓥ Bogen Co., Inc., David, 663 Broadway, New York 12, N. Y. (h)
Ⓥ CHICAGO TRANSFORMER DIV., Essex Wire Corp., 3501 W. Addison St., Chicago 18, Ill. ADV. PG. 229. (h)
Ⓥ Cole Radio Works, 86 Westville Ave., Caldwell, N. J. (h)
Ⓥ Comet Transformer Corp., 1034-36 W. North Ave., Chicago 22, Ill. (h)
Ⓥ DANO ELECTRIC CO., Main St., Winsted, Conn. ADV. PG. 273. (h)
Ⓥ Davis & Co., Dean W., Kentland, Ind. (h)
Ⓥ Delco Radio Div., General Motors Corp., Kokomo, Ind. (h)
Ⓥ Dinion Coil Co., Inc., Caledonia, N. Y. (h)
Ⓥ Dressner Electric Co., 942 E. Larned St., Detroit 7, Mich. (h)
Ⓥ Eisler Engineering Co., Inc., 740 S. 13th St., Newark 3, N. J. (h)
Ⓥ Electran Mfg. Co., 4596 Elston Ave., Chicago 30, Ill. (h)
Ⓥ Electrical Windings, Inc., 2015 N. Kolmar Ave., Chicago 39, Ill. (h)
Electrical Transformer Co., Westerly Rd., Dayville, N. Y. (h)
Ⓥ Electro Engineering Works, 6021 College Ave., Oakland 18, Calif. (h)
Ⓥ Electro Mfg. Co., Inc., Woods Church Rd., Flemington, N. J. (h)
Electronic Products Div., Epco Products, Inc., 2430 Atlantic Ave., Brooklyn 33, N. Y. (h)
Ⓥ ELECTRONIC TRANSFORMER CO., INC., 215 W. 25th St., New York, N. Y. ADV. PG. 116. (h)
Empire Coil Co., Inc., 258 Huguenot St., New Rochelle, N. Y. (h)
Ⓥ FERRANTI ELECTRIC, INC., 30 Rockefeller Plaza, New York 20, N. Y. ADV. PG. 81. (h)
Ⓥ Foster Transformer Co., Inc., 3620 Colerain Ave., Cincinnati 23, Ohio. (h)
Ⓥ FREED TRANSFORMER CO., INC., 1736 Weirfield St., Brooklyn 27, N. Y. ADV. Pg. 143. (h)
Ⓥ General Labs., Inc., 8 East Ave., New York 21, N. Y. (h)
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. Pg. 8 to 18. (h)
General Transformer Co., 18240 Harwood Ave., Homewood, Ill. (h)
Gesin Electric & Mfg. Co., 2921 W. Olive St., Burbank, Calif. (h)
Ⓥ Gramer Co., The, 2734 N. Pulaski Rd., Chicago 39, Ill. (h)
Ⓥ Harrison Co., The, 4100 Ravenswood Ave., Chicago 40, Ill. (h)
Hartley Co., Ltd., H. A., 152 Hammersmith Rd., London W. 6, England. (h)
Ⓥ Hercules Electric & Mfg. Co., Inc., 2500 Atlantic Ave., Brooklyn 7, N. Y. (h)
Ⓥ HIGHLAND ENGINEERING CO., 32 Holman Blvd., Hicksville, N. Y. ADV. Pg. 194. (h)
Industrial Equipment Co., Gettysburg, Pa. (h)
Jefferson Electric Co., Bellwood, Ill. (h)
Ⓥ K-V Transformer Corp., 4414 Park Ave., New York 57, N. Y. (h)
Ⓥ KENYON TRANSFORMER CO., INC., 840 Barry St., New York 59, N. Y. ADV. PG. 135. (h)
Ⓥ Langevin Mfg. Corp., 37 W. 65th St., New York 23, N. Y. (h)
Ⓥ Lenkurt Electric Co., Inc., San Carlos, Calif. (h)
Light Electric Corp., 214 Lackawanna Ave., Newark 4, N. J. (h)
Ⓥ Magnetic Instrument Co., 62 W. Main St., West Orange, N. J. (h)
Ⓥ Magnetic Windings Div., Essex Wire Corp., Freemansburg Ave. & Hobson Blvd., Easton, Pa. (h)
Mesto Products, Inc., 32 E. Hennepin Ave., Minneapolis 5, Minn. (h)
Ⓥ Metaphone Corp., Rochester 2, N. Y. (h)
Ⓥ Merit Coil & Transformer Corp., 4427 N. Clark St., Chicago 40, Ill. (h)
Ⓥ Miller Co., B. F., P. O. Box 563, Trenton 4, N. J. (h)
Ⓥ NEW YORK TRANSFORMER CO., INC., Third Ave., Alpha, N. J. ADV. PG. 284. (h)
Ⓥ Nothelfer Winding Labs., 9 Albemarle Ave., Trenton 7, N. J. (h)
Ⓥ OPAD GREEN CO., 71 Warren St., New York 7, N. Y. ADV. PG. 274. (h)
Peerless Electrical Products Co., 6920 McKinley Ave., Los Angeles 1, Calif. (h)
Ⓥ Police Corp., Tioga & C Sts., Philadelphia 34, Pa. (h)
Ⓥ Pilmore Mfg. Co., 113 University Place, New York 3, N. Y. (h)
Ⓥ RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. Pg. 257. (h)
Ⓥ Red Arrow Electric Corp., 100 Colt St., Irvington 11, N. J. (h)
Ⓥ "S" CORRUGATED QUENCHED GAP CO., Scientific Electric Div., 107 Monroe St., Garfield, N. J. ADV. PG. 269. (h)
Ⓥ S. N. C. Mfg. Co., Inc., Box 277, Oshkosh, Wis. (h)
Ⓥ SORENSON & CO., INC., 375 Fairfield Ave., Stamford, Conn. ADV. PG. 145. (h)
Ⓥ Sorgel Electric Co., 838 W. National Ave., Milwaukee 4, Wis. (h)
Ⓥ SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86. (h)
Ⓥ Standard Electrical Products Co., 402 E. 1st St., Dayton, Ohio. (h)
Ⓥ STANDARD TRANSFORMER CORP., Elston, Keddie and Addison, Chicago 18, Ill. ADV. PG. 62. (h)
Ⓥ Stanwyck Winding Co., 137 Walsh Ave., Newburgh, N. Y. (h)
Ⓥ Stolle Engineering & Mfg. Co., 3970 S. Grand Ave., Los Angeles 37, Calif. (h)
Ⓥ Super Electric Products Corp., 46 Oliver St., Newark, N. J. (h)
Tech-Master Products Co., 443-5 Broadway, New York 13, N. Y. (h)
Ⓥ Tele-Video Corp., 241 Fairfield Ave., Upper Darby, Pa. (h)
Ⓥ Thor Electric & Machine Works, 15 S. Jefferson St., Chicago 11. (h)
Ⓥ Thermador Electric Mfg. Co., 5119 District Blvd., Los Angeles 22, Calif. (h)
Ⓥ Thordarson Electric Mfg. Div., Maguire Industries, Inc., 500 W. Huron St., Chicago 10, Ill. (h)
Ⓥ Transformer Engineers, 389 S. Arroyo Parkway, Pasadena, Calif. (h)
Ⓥ Triad Transformer Mfg. Co., 2254 Sepulveda Blvd., Los Angeles 64, Calif. (h)
Ⓥ Union Electric Products Co., 24 Edison Pl., Newark 2, N. J. (h)
Ⓥ UNITED TRANSFORMER CO., 150 Varick St., New York 13, N. Y. Inside Front Cover. (h)
Utah, Inc., E. Franklin St., Huntington, Ind. (h)
Ⓥ Wagner Electric Corp., 6400 Plymouth Ave., St. Louis, Mo. (h)
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Ⓥ Wheeler Insulated Wire Co., Inc., 150 E. Aurora St., Waterbury 91, Conn. (h)

TRANSFORMERS—*Pulse*

Ⓥ ACME ELECTRIC CORP., 31 Water St., Cuba, N. Y. ADV. PG. 210. (h)
Ⓥ Acro Products Co., 5330 Baltimore Ave., Philadelphia, Pa. (h)
Ⓥ Acro Transformer Mfg. Corp., 21-20 33rd Ave., Long Island City, N. Y. (h)
Ⓥ Airdesign, Inc., 241 Fairfield Ave., Upper Darby, Pa. (h)
Ⓥ AIRPAX PRODUCTS CO., 1024 Greenmount Ave., Baltimore 2, Md. ADV. PG. 275. (h)
Ⓥ Allen Lansing Corp., 161 Avenue of the Americas, New York 13, N. Y. (h)
Ⓥ American Transformer Co., 265 Emmett St., Newark, N. J. (h)
Ⓥ Audio Development Co., 2833 13th Ave. S., Minneapolis 7, Minn. (h)
Ⓥ Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md. (h)
Ⓥ COMMUNICATION ACCESSORIES CO., Box 345, 110th St. & Hillcrest Rd., Hickman Mills, Mo. ADV. PG. 178. (h)
Ⓥ Dinion Coil Co., Inc., Caledonia, N. Y. (h)
Ⓥ Electron Mfg. Co., 4596 Elston Ave., Chicago 30, Ill. (h)
Ⓥ Electro Engineering Works, 6021 College Ave., Oakland 18, Calif. (h)
Ⓥ ELECTRONIC TRANSFORMER CO., INC., 215 W. 25th St., New York, N. Y. ADV. PG. 116. (h)
Ⓥ Foster Transformer Co., Inc., 3620 Colerain Ave., Cincinnati 23, Ohio. (h)
Ⓥ FREED TRANSFORMER CO., INC., 1736 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 143. (h)
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18. (h)
Gesin Electric & Mfg. Co., 2921 W. Olive St., Burbank, Calif. (h)
Ⓥ HIGHLAND ENGINEERING CO., 32 Holman Blvd., Hicksville, N. Y. ADV. PG. 194. (h)
Industrial Equipment Co., Gettysburg, Pa. (h)
Ⓥ K-V Transformer Corp., 4414 Park Ave., New York 57, N. Y. (h)
Ⓥ KENYON TRANSFORMER CO., INC., 840 Barry St., New York 59, N. Y. ADV. PG. 135. (h)
Ⓥ Magnetic Windings Div., Essex Wire Corp., Freemansburg Ave. & Hobson Blvd., Easton, Pa. (h)
Mesto Products, Inc., 32 E. Hennepin Ave., Minneapolis 5, Minn. (h)
Ⓥ Nothelfer Winding Labs., 9 Albemarle Ave., Trenton 7, N. J. (h)
Peerless Electrical Products Co., 6920 McKinley Ave., Los Angeles 1, Calif. (h)
Ⓥ RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. Pg. 257. (h)
Ⓥ Red Arrow Electric Corp., 100 Colt St., Irvington 11, N. J. (h)
Ⓥ SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. Pg. 85, 86. (h)
Ⓥ Stolle Engineering & Mfg. Co., 3970 S. Grand Ave., Los Angeles 37, Calif. (h)
Ⓥ Tele-Video Corp., 241 Fairfield Ave., Upper Darby, Pa. (h)
Ⓥ Thermador Electric Mfg. Co., 5119 District Blvd., Los Angeles 22, Calif. (h)
Ⓥ Thordarson Electric Mfg. Div., Maguire Industries, Inc., 500 W. Huron St., Chicago 10, Ill. (h)
Ⓥ Transformer Engineers, 389 S. Arroyo Parkway, Pasadena, Calif. (h)
Ⓥ UNITED TRANSFORMER CO., 150 Varick St., New York 13, N. Y. ADV. PG. Inside Front Cover. (h)
Utah, Inc., E. Franklin St., Huntington, Ind. (h)
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

TRANSFORMERS—*r-f*

Ⓥ ACME ELECTRIC CORP., 31 Water St., Cuba, N. Y. ADV. PG. 210. (h)
Ⓥ Automatic Mfg. Corp., 65 Gouverneur St., Newark 4, N. J. (h)
Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. Pg. 169. (h)
Ⓥ Cassell-Burns Mfg. Co., 480 Broome St., New York 13, N. Y. (h)
Ⓥ Doolittle Radio, Inc., 7421 S. Loomis Blvd., Chicago 36, Ill. (h)
Ⓥ ELECTRONIC TRANSFORMER CO., INC., 215 W. 25th St., New York, N. Y. ADV. PG. 116. (h)
Ⓥ FUGLE-MILLER LABORATORIES, 398 Main St., Metuchen, N. J. ADV. PG. 164. (h)
Ⓥ HARNETT ELECTRIC CORP., 138 Haven Ave., Port Washington, L. I., N. Y. ADV. PG. 182. (h)

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

Ⓥ HILLBURN ELECTRONIC PRODUCTS CO., 55 Nassau Ave., Brooklyn 22, N. Y. ADV. PG. 46.
Ⓥ HOULIHAN CO., T. J., 2508-14 Lawrence Ave., Chicago 25, Ill. ADV. PG. 276.
Inductive Equipment Co., Gettysburg, Pa.
Ⓥ Johnson Co., E. F., Waseca, Minn.
Ⓥ Lenkurt Electric Co., Inc., San Carlos, Calif.
Leonard Electric Products Co., Inc., 1562 61st St., Brooklyn 19, N. Y.
Loral Electronics Corp., 794 E. 140th St., New York 54, N. Y. (h)
Ⓥ Lynmar Engineers, Inc., 1721 Delancey St., Philadelphia 3, Pa.
Meissner Mfg. Div., Maguire Industries, Inc., Mt. Carmel, Ill.
Ⓥ Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.
Ⓥ Miller Co., J. W., 5917 S. Main St., Los Angeles, Calif.
Miller Co., 1256 S. Michigan Ave., Chicago, Ill.
Ⓥ NATIONAL CO., INC., 61 Sherman St., Malden 48, Mass. ADV. PG. 33 to 36.
Peerless Electrical Products Co., 6920 McKinley Ave., Los Angeles 1, Calif.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
Ross Mfg. Co., 860 Washington St., Burlington, Iowa.
Sickles Co., F. W., P. O. Box 330, Chicopee, Mass.
Ⓥ Stoltz Engineering & Mfg. Co., 3970 S. Grand Ave., Los Angeles 37, Calif.
Ⓥ Super Electric Products Corp., 46 Oliver St., Newark, N. J. (h)
Ⓥ Television Co., The, 4014 Prospect Ave., Cleveland 3, Ohio.
Ⓥ Teleradio Engineering Corp., 99 Wall St., New York 5, N. Y.
Ⓥ U. S. ELECTRONICS CORP., 276 Warren St., Lyndhurst, N. J. ADV. PG. 266.

TRANSFORMERS—*r-f and i-f*

Ⓥ ACME ELECTRIC CORP., 31 Water St., Cuba, N. Y. ADV. PG. 210.
Ⓥ Automatic Mfg. Corp., 65 Gouverneur St., Newark 4, N. J.
Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ Caddell-Burns Mfg. Co., 480 Broome St., New York 13, N. Y.
Ⓥ Collins Radio Co., Cedar Rapids, Iowa.
Ⓥ Delco Radio Div., General Motors Corp., Kokomo, Ind.
Dietz Design & Mfg. Co., 5810 Park Ave., Kansas City 4, Mo.
Ⓥ Doolittle Radio, Inc., 7421 S. Loomis Blvd., Chicago 36, Ill.
Ⓥ ELECTRONIC TRANSFORMER CO., INC., 215 W. 25th St., New York, N. Y. ADV. PG. 116.
Ⓥ Essex Electronics, Berkeley Heights, N. J. (h)
Ⓥ FUGLE-MILLER LABORATORIES, 398 Main St., Metuchen, N. J. ADV. PG. 164.
Ⓥ HARNETT ELECTRIC CORP., 138 Haven Ave., Port Washington, L. I., N. Y. ADV. PG. 182.
Ⓥ HILLBURN ELECTRONIC PRODUCTS CO., 55 Nassau Ave., Brooklyn 22, N. Y. ADV. PG. 46.
Ⓥ HOULIHAN CO., T. J., 2508-14 W. Lawrence Ave., Chicago 25, Ill. ADV. PG. 276.
Inductive Equipment Co., Gettysburg, Pa.
Ⓥ Lenkurt Electric Co., Inc., San Carlos, Calif. (h)
Leonard Electric Products Co., Inc., 1562 61st St., Brooklyn 19, N. Y.
Loral Electronics Corp., 794 E. 140th St., New York 54, N. Y. (h)
McMurdo Silver Co., 1240 Main St., Hartford 1, Conn.
Meissner Mfg. Div., Maguire Industries, Inc., Mt. Carmel, Ill.
Ⓥ Miller Mfg. Co., James, 150 Exchange St., Malden, Mass.
Ⓥ Miller Co., J. W., 5917 S. Main St., Los Angeles, Calif.
Miller Co., 1256 S. Michigan Ave., Chicago, Ill.
Ⓥ NATIONAL CO., INC., 61 Sherman St., Malden 48, Mass. ADV. PG. 33 to 36.
Ⓥ North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
Peerless Electrical Products Co., 6920 McKinley Ave., Los Angeles 1, Calif.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75. Inside Back and Back Covers.
Ⓥ RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
Rollo Electrical Co., 8020 S. South Park, Chicago, Ill.
Ross Mfg. Co., 860 Washington St., Burlington, Iowa.
Sickles Co., F. W., P. O. Box 330, Chicopee, Mass.
Ⓥ Stanwick Winding Company, 137 Walton Ave., Newburgh, N. Y.
Ⓥ Stoltz Engineering & Mfg. Co., 3970 S. Grand Ave., Los Angeles 37, Calif.
Ⓥ Super Electric Products Corp., 46 Oliver St., Newark, N. J. (h)
Tech-Master Products Co., 443-5 Broadway, New York 13, N. Y.
Ⓥ Teleradio Engineering Corp., 99 Wall St., New York 5, N. Y.
Ⓥ U. S. ELECTRONICS CORP., 276 Warren St., Lyndhurst, N. J. ADV. PG. 266.

TRANSFORMERS—*Rhombic Antenna Coupling*

Ⓥ ACME ELECTRIC CORP., 31 Water St., Cuba, N. Y. ADV. PG. 210. (h)
Ⓥ Andrew Corp., 363 E. 75th St., Chicago 19, Ill.
Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Inductive Equipment Co., Gettysburg, Pa.
Ⓥ Lenkurt Electric Co., Inc., San Carlos, Calif. (h)
Ⓥ Miller Co., J. W., 5917 S. Main St., Los Angeles, Calif.
Ⓥ U. S. ELECTRONICS CORP., 276 Warren St., Lyndhurst, N. J. ADV. PG. 266.

TRANSFORMERS—*Tone Oscillator*

Ⓥ ACME ELECTRIC CORP., 31 Water St., Cuba, N. Y. ADV. PG. 210. (h)
Ⓥ Acro Transformer Mfg. Corp., 21-20 33rd Ave., Long Island City, N. Y. (h)
Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ Hendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md. (h)
Ⓥ BURNELL & CO., 45 Warburton Ave., Yonkers 2, N. Y. ADV. PG. 59.
Ⓥ COMMUNICATION ACCESSORIES CO., Box 345, 110th St. & Hillcrest Rd., Hickman Hills, Mo. ADV. PG. 178.
Ⓥ ELECTRONIC TRANSFORMER CO., INC., 215 W. 25th St., New York, N. Y. ADV. PG. 116. (h)
Ⓥ FERRANTI ELECTRIC, INC., 30 Rockefeller Plaza, New York 20, N. Y. ADV. PG. 81. (h)
Ⓥ FREED TRANSFORMER CO., INC., 1736 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 143. (h)
Inductive Equipment Co., Gettysburg, Pa.
Ⓥ KENYON TRANSFORMER CO., INC., 840 Barry St., New York 59, N. Y. ADV. PG. 135.
Ⓥ Lenkurt Electric Co., Inc., San Carlos, Calif. (h)
Ⓥ Super Electric Products Corp., 46 Oliver St., Newark, N. J. (h)
Ⓥ Thordarson Electric Mfg. Div., Maguire Industries, Inc., 500 W. Huron St., Chicago 10, Ill. (h)
Ⓥ U. S. ELECTRONICS CORP., 276 Warren St., Lyndhurst, N. J. ADV. PG. 266.
Ⓥ UNITED TRANSFORMER CO., 150 Varick St., New York 13, N. Y. ADV. PG. Inside Front Cover. (h)

TRANSFORMERS—*Ultrasonic*

Ⓥ ACME ELECTRIC CORP., 31 Water St., Cuba, N. Y. ADV. PG. 210. (h)
Ⓥ Acro Transformer Mfg. Corp., 21-20 33rd Ave., Long Island City, N. Y. (h)
Ⓥ Audio Development Co., 2833 13th Ave., S. Minneapolis 7, Minn. (h)
Ⓥ COMMUNICATION ACCESSORIES CO., Box 345, 110th St. & Hillcrest Rd., Hickman Hills, Missouri. ADV. PG. 178.
Ⓥ ELECTRONIC TRANSFORMER CO., INC., 215 W. 25th St., New York, N. Y. ADV. PG. 116. (h)
Ⓥ FERRANTI ELECTRIC, INC., 30 Rockefeller Plaza, New York 20, N. Y. ADV. PG. 81. (h)
Ⓥ FREED TRANSFORMER CO., INC., 1736 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 143.
Inductive Equipment Co., Gettysburg, Pa.
Ⓥ KENYON TRANSFORMER CO., INC., 840 Barry St., New York 59, N. Y. ADV. PG. 135. (h)
Ⓥ Lenkurt Electric Co., Inc., San Carlos, Calif. (h)
Ⓥ RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.

TRANSFORMERS—*Vacuum Microwave*

Ⓥ ACME ELECTRIC CORP., 31 Water St., Cuba, N. Y. ADV. PG. 210.
Ⓥ Foster Transformer Co., Inc., 3820 Colerain Ave., Cincinnati 23, Ohio. (h)
Inductive Equipment Co., Gettysburg, Pa.
JENNINGS RADIO MFG. CO., 1099 E. William St., San Jose 12, Calif. ADV. PG. 114, 115.

TRANSFORMERS—*Vibrator*

See Transformers, Power

TRANSFORMERS—*Voltage Regulating*

Ⓥ ACME ELECTRIC CORP., 31 Water St., Cuba, N. Y. ADV. PG. 210. (h)
Acro Transformer Mfg. Corp., 21-20 33rd Ave., Long Island City, N. Y.
Ⓥ American Transformer Co., 285 Emmett St., Newark, N. J. (h)
Amos Co., R. B., 1101 N. Delaware St., Indianapolis, Ind.
Ⓥ Crest Transformer Corp., 1834-36 W. North Ave., Chicago 22, Ill. (h)
Ⓥ Electrical Windings, Inc., 2015 N. Kolmar Ave., Chicago 39, Ill. (h)
Ⓥ Electro Engineering Works, 6021 College Ave., Oakland 18, Calif. (h)
Ⓥ ELECTRONIC TRANSFORMER CO., INC., 215 W. 25th St., New York, N. Y. ADV. PG. 116. (h)
Ⓥ FERRANTI ELECTRIC, INC., 30 Rockefeller Plaza, New York 20, N. Y. ADV. PG. 81. (h)
Ⓥ Foster Transformer Co., Inc., 3820 Colerain Ave., Cincinnati 23, Ohio. (h)
Ⓥ FREED TRANSFORMER CO., INC., 1736 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 143. (h)
Ⓥ Gates Radio Co., Quincy, Ill.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18. (h)
Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Ⓥ Gramer Co., The, 2734 N. Pulaski Rd., Chicago 39, Ill.
Ⓥ Halldorson Co., The, 4500 Ravenswood Ave., Chicago 40, Ill.
Ⓥ HIGHLAND ENGINEERING CO., 32 Holman Blvd., Hicksville, N. Y. ADV. PG. 194. (h)
Ⓥ J F D MFG. CO., 6101-23 Sixteenth Ave., Brooklyn, N. Y. ADV. PG. 254, 264.
Ⓥ Magnetic Instrument Co., 82 W. Main St., West Orange, N. J.
Meico Products, Inc., 22 E. Hennepen Ave., Minneapolis 1, Minn.
Ⓥ Miller Co., B. F., P. O. Box 568, Trenton 4, N. J.
Ⓥ North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
Peerless Electrical Products Co., 6920 McKinley Ave., Los Angeles 1, Calif.
Ⓥ RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
Ⓥ Sola Electric Co., 4633 W. 16th St., Chicago 50, Ill. (h)
Ⓥ SORENSON & CO., INC., 375 Fairfield Ave., Stamford, Conn. ADV. PG. 141.
Ⓥ Standard Electrical Products Co., 402 E. 1st St., Dayton, Ohio. (h)
Ⓥ STANDARD TRANSFORMER CORP., Elston, Keeler & Addison, Chicago 18, Ill. ADV. PG. 62. (h)
Ⓥ SUPERIOR ELECTRIC CO., THE, 83 Meadow St., Bristol, Conn. ADV. PG. 110, 111.
Ⓥ Thermador Electric Mfg. Co., 5119 District Blvd., Los Angeles 22, Calif. (h)
Ⓥ Thordarson Electric Mfg. Div., Maguire Industries, Inc., 500 W. Huron St., Chicago 10, Ill. (h)
Ⓥ Union Electric Products Co., 24 Edison Pl., Newark 2, N. J.
Ⓥ UNITED TRANSFORMER CO., 150 Varick St., New York 13, N. Y. ADV. PG. Inside Front Cover. (h)
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

TRANSFORMERS—*Welding*

Ⓥ ACME ELECTRIC CORP., 31 Water St., Cuba, N. Y. ADV. PG. 210. (h)
Ⓥ AMERICAN TRANSFORMER CO., 285 Emmett St., Newark, N. J. (h)
Arco Transformer & Electrical Co., 1602 S. Harrison St., Fort Wayne, Ind. (h)
Ⓥ Crest Transformer Corp., 1834-36 W. North Ave., Chicago 22, Ill. (h)
Ⓥ Davis & Co., Dean W., Kentland, Ind.
Ⓥ Emler Engineering Co., Inc., 740 S. 13th St., Newark 3, N. J.
Ⓥ Electran Mfg. Co., 4946 Elston Ave., Chicago 30, Ill.
Electronic Transformer Co., Westerly Rd., Ossining, N. Y.
Ⓥ Electro Engineering Works, 6021 College Ave., Oakland 18, Calif. (h)
Ⓥ ELECTRONIC TRANSFORMER CO., INC., 215 W. 25th St., New York, N. Y. ADV. PG. 116. (h)
Ⓥ Ettrack Mfg. Co., Inc., Woods Church Rd., Flemington, N. J.
FERRANTI ELECTRIC, INC., 30 Rockefeller Plaza, New York 20, N. Y. ADV. PG. 81. (h)
Ⓥ FREED TRANSFORMER CO., INC., 1736 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 143. (h)
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18. (h)
Ⓥ Hercules Electric & Mfg. Co., Inc., 2500 Atlantic Ave., Brooklyn 7, N. Y.
Ⓥ HIGHLAND ENGINEERING CO., 32 Holman Blvd., Hicksville, N. Y. ADV. PG. 194. (h)
Light Electric Corp., 214 Lackawanna Ave., Newark 4, N. J.
Ⓥ Nothelfer Winding Labs., 9 Albemarle Ave., Trenton 3, N. J.
Peerless Electrical Products Co., 6920 McKinley Ave., Los Angeles 1, Calif.
Ⓥ Progressive Welder Co., 3050 E. Outer Dr., Detroit, Mich.
Ⓥ RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
Ⓥ Red Arrow Electric Corp., 100 Colt St., Irvington 11, N. J. (h)
Ⓥ Sorgel Electric Co., 838 W. National Ave., Milwaukee 4, Wis.
Ⓥ STANDARD TRANSFORMER CORP., Elston, Keeler & Addison, Chicago 18, Illinois. ADV. PG. 62. (h)
Ⓥ Thordarson Electric Mfg. Div., Maguire Industries, Inc., 500 W. Huron St., Chicago 10, Ill. (h)
Ⓥ UNITED TRANSFORMER CO., 150 Varick St., New York 13, N. Y. ADV. PG. Inside Front Cover. (h)

V indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

TRANSFORMERS—*X-Ray*

V ACME ELECTRIC CORP., 31 Water St., Cuba, N. Y. ADV. PG. 210.
V Davis & Co., Dean W., Kentland, Ind.
V Dressler Electric Co., 942 E. Larned St., Detroit 7, Mich.
V Electrical Windings, Inc., 2615 N. Kolmar Ave., Chicago 39, Ill.
Electronic Transformer Co., Westerly Rd., Deposit, N. Y.
V ELECTRONIC TRANSFORMER CO., INC., 215 W. 25th St., New York, N. Y. ADV. PG. 216.
V Elrace Mfg. Co., Inc., Woods Church Rd., Flemington, N. J.
V FERRANTI ELECTRIC, INC., 30 Rockefeller Plaza, New York 20, N. Y. ADV. PG. 81.
V Ferroxcube Transformer Co., Inc., 3820 Colerain Ave., Cincinnati 23, Ohio.
V FREED TRANSFORMER CO., INC., 1716 Weirfield St., Brooklyn 27, N. Y. ADV. PG. 183.
V GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
V General Electric X-Ray Corp., 4855 W. McGeoch Ave., Milwaukee, Wis.
V HIGHLAND ENGINEERING CO., 52 Holman Blvd., Hicksville, N. Y. ADV. PG. 194.
V North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
V Nothelfer Winding Labs., 9 Allemania Ave., Trenton 3, N. J.
Peerless Electrical Products Co., 6920 McKinley Ave., Los Angeles 1, Calif.
V Picker X-Ray Corp., 300 Fourth Ave., New York 10, N. Y.
V Red Arrow Electric Corp., 100 Colt St., Irvington 11, N. J.
V Thermador Electric Mfg. Co., 5119 District Blvd., Los Angeles 22, Calif.
V Thordarson Electric Mfg. Div., Maguire Industries, Inc., 500 W. Huron St., Chicago 10, Ill.
V Triplett & Barton, Inc., 811 N. Lake St., Burbank, Calif.
V UNITED TRANSFORMER CO., 150 Varick St., New York 7, N. Y. ADV. PG. Inside Front Cover.
V WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

TRANSISTORS

V GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
V RAYTHEON MFG. CO., Power Tube Div., Waltham 54, Mass. ADV. PG. 257.

TRANSMISSION LINES

See Cable, Coaxial or Waveguides

TRANSMITTERS—*Aircraft*

V Aeronautical Communications Equipment, Inc., 3090 Douglas Rd., Miami 33, Fla.
V Air Associates, Inc., Teterboro, N. J.
V AIRCRAFT RADIO CORP., Boonton, N. J. ADV. PG. 198, 199.
V Belmont Radio Co., Div. Raytheon Mfg. Co., 5921 W. Dickens Ave., Chicago 39, Ill.
V Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
V Collins Radio Co., Cedar Rapids, Iowa.
V Communications Co., Inc., 300 Grand Ave., Coral Gables 34, Fla.
Electronic Specialty Co., 3456 Glendale Blvd., Los Angeles 39, Calif.
V GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
Jervis Electronics Corp., 6068 W. Fullerton Ave., Chicago 39, Ill.
V Lear, Inc., 110 Ionia Ave., N. W., Grand Rapids 2, Mich.
V Mitchell Industries, Inc., Camp Wolters, Mineral Wells, Texas.
V RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 75. Inside Back and Back Covers.
V RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Smuckler & Co., Inc., A. F., 202 Tillary St., Brooklyn 1, N. Y.
V Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
V Transmitter Equipment Co., Inc., 345 Hudson St., New York 14, N. Y.
V Wilcox Electric Co., 1400 Chestnut St., Kansas City, Mo.

TRANSMITTERS—*Amateur*

V BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
V Collins Radio Co., Cedar Rapids, Iowa.
V Communications Co., Inc., 300 Grand Ave., Coral Gables 34, Fla.
V EL-TRONICS INC., 2649 No. Howard St., Philadelphia 34, Pa. ADV. PG. 238.
V Hallicrafters Co., 4401 W. Fifth Ave., Chicago 24, Ill.
V Harvey Wells Electronics Inc., North St., Southbridge, Mass.
V Johnson Co., E. F., Waseca, Minn.
McMurdo Silver Co., Inc., 1240 Main St., Hartford 3, Conn.
Meissner Mfg. Div., Maguire Industries, Inc., Mt. Carmel, Ill.
V Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.
V Radio Transceiver Labs., 126-23 Jamaica Ave., Richmond Hill 18, N. Y.
V RAYTHEON MFG. CO., Power Tube Div., Waltham 54, Mass. ADV. PG. 257.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Sigma Electronics Corp., San Carlos, Calif.
Smuckler & Co., Inc., A. F., 202 Tillary St., Brooklyn 1, N. Y.
V STANDARD TRANSFORMER CORP., Elston, Kedzie & Addison, Chicago 18, Ill. ADV. PG. 62.
V Telelectronics Laboratory, Inc., 352 Maple Ave., Westbury, L. I., N. Y.
V Transmitter Equipment Mfg. Co., Inc., 345 Hudson St., New York 14, N. Y.

TRANSMITTERS—*Broadcast*

V BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
V Collins Radio Co., Cedar Rapids, Iowa.
Continental Electronics Mfg. Co., 1728 Wood St., Dallas 1, Texas.
Erco Radio Labs., Inc., East Stewart Ave., Garden City, N. Y.
V FEDERAL TELEPHONE AND RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.
V Gates Radio Co., Quincy, Ill.
V GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
V Press Wireless Mfg. Co., Inc., Cantiague Rd., Hicksville, L. I., N. Y.
V RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 75. Inside Back and Back Covers.
V Radio Engineering Labs., Inc., 36-40 37th St., Long Island City, N. Y.
V RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
V REEVES-HOFFMAN CORP., 321 Cherry St., Carlisle, Pa. ADV. PG. 32.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Smuckler & Co., Inc., 202 Tillary St., Brooklyn 1, N. Y.
V Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
V Transmitter Equipment Co., Inc., 345 Hudson St., New York 14, N. Y.
V WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

TRANSMITTERS—*Broadcast STL*

V BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
V FEDERAL TELEPHONE AND RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.
V GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
V HARVEY RADIO LABS., INC., 447 Concord Ave., Cambridge, Mass. ADV. PG. 104.
V Link Radio Corp., 125 W. 17th St., New York, N. Y.
V RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 75. Inside Back and Back Covers.
V Radio Engineering Labs., Inc., 36-40 37th St., Long Island City, N. Y.
V RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Smuckler & Co., Inc., A. F., 202 Tillary St., Brooklyn 1, N. Y.

TRANSMITTERS—*Citizen's Radio*

V Collins & Bixen, 2330 Otsego Rd., N.W., Washington 10, D. C.
V Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.

TRANSMITTERS—*Color Television*

Hamlin Television Mfg. Co., 44-24 Dutton Blvd., Jamaica 4, N. Y.
V RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 75. Inside Back and Back Covers.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
V WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

TRANSMITTERS—*Direction Finding*

V Aeronautical Communications Equipment, Inc., 3090 Douglas Rd., Miami 33, Fla.
V Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.
Erco Radio Labs., Inc., East Stewart Ave., Garden City, N. Y.
Grady Instrument Co., 689 Belmont St., Belmont 78, Mass.
V RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Smuckler & Co., Inc., A. F., 202 Tillary St., Brooklyn 1, N. Y.
V Transmitter Equipment Co., Inc., 345 Hudson St., New York 14, N. Y.

TRANSMITTERS—*f-m*

V BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
V Capehart-Farnsworth Corp., Fort Wayne, Indiana.
V Collins Radio Co., Cedar Rapids, Iowa.
V Communications Co., Inc., 300 Grand Ave., Coral Gables 34, Fla.
V Doolittle Radio, Inc., 7421 S. Loomis Blvd., Chicago 36, Ill.
V EL-TRONICS INC., 2649 No. Howard St., Philadelphia 34, Pa. ADV. PG. 238.
V FEDERAL TELEPHONE AND RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.
V Gates Radio Co., Quincy, Ill.
V GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
V HARVEY RADIO LABS., INC., 447 Concord Ave., Cambridge, Mass. ADV. PG. 104.
V Hastings Instrument Co., Box 1275, Hampton, Va.
V Maryland Electronic Mfg. Corp., 5009 Calvert Rd., College Park, Md.
V Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
V RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 75. Inside Back and Back Covers.
V Radio Engineering Labs., Inc., 36-40 37th St., Long Island City, N. Y.
V RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
V REEVES-HOFFMAN CORP., 321 Cherry St., Carlisle, Pa. ADV. PG. 32.
V Schuttig & Co., Inc., 918 & Kearsley Sts., N. E., Washington 17, D. C.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Smuckler & Co., Inc., A. F., 202 Tillary St., Brooklyn 1, N. Y.
V SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 86.
V Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
V WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

TRANSMITTERS—*Facsimile*

V Acme Telephone Div. of NEA Service, Inc., West 6th & Lakeside, Cleveland 13, Ohio.
V ALDEN PRODUCTS CO., 117 No. Main St., Brockton 64, Mass. ADV. PG. 235.
V BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
V Hogan Laboratories, Inc., 156 Perry St., New York 14, N. Y.
V Muirhead Mfg. Corp., Littleton, Mass.
V MUIRHEAD & CO., LTD., Beckenham, Kent, England.
V Press Wireless Mfg. Co., Inc., Cantiague Rd., Hicksville, L. I., N. Y.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
V TIMES FACSIMILE CORP., 229 W. 43rd St., New York 18, N. Y. ADV. PG. 67.
V WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

TRANSMITTERS—*Fixed Frequency*

V Aeronautical Communications Equipment, Inc., 3090 Douglas Rd., Miami 33, Fla.
V Amptel Electronics Co., 1246 Folsom St., San Francisco 3, Calif.
V Autograph Co., 1414 El Camino Real, San Carlos, Calif.
V BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
V Bassett, Inc., Rex, 107-11 N.W. 1st Ave., Fort Lauderdale, Fla.
V Belmont Radio Co., Div., Raytheon Mfg. Co., 5921 W. Dickens Ave., Chicago 39, Ill.
V Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.
V Collins Radio Co., Cedar Rapids, Iowa.
V Communications Co., Inc., 300 Grand Ave., Coral Gables 34, Fla.

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

Ⓥ Doolittle Radio, Inc., 7421 S. Loomis Blvd., Chicago 36, Ill.
Ⓥ EL-TRONICS INC., 2649 No. Howard St., Philadelphia 33, Pa. ADV. PG. 238.
Erco Radio Labs., Inc., East Stewart Ave., Garden City, N. Y.
Ⓥ Gates Radio Co., Quincy, Ill.
Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
Ⓥ Hastings Instrument Co., Box 1275, Hampton, Va.
Hose-McCann Telephone Co., Inc., 25th St. & 3rd Ave., Brooklyn 32, N. Y.
Ⓥ Intervox Corp., 2701 California Ave., Seattle 6, Wash.
Ⓥ Kaar Engineering Co., 2995 Middlefield Rd., Palo Alto, Calif.
Ⓥ LAVOIE LABORATORIES, Morganville, N. J. ADV. PG. 151.
Ⓥ Maryland Electronic Mfg. Corp., 5009 Calvert Road, College Park, Maryland.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Press Wireless Mfg. Co., Inc., Cantiague Rd., Hicksville, L. I., N. Y.
Ⓥ RADIO RECEPTOR CO., 251 W. 19th St., New York 11, N. Y. ADV. PG. 188.
Radio Specialty Mfg. Co., 2023 S. E. Sixth Ave., Portland 14, Ore.
Ⓥ RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
Ⓥ REEVES-HOFFMAN CORP., 321 Cherry St., Carlisle, Pa. ADV. PG. 32.
Ⓥ Schottig & Co., Inc., 9th & Kearney Sts., N.E., Washington 17, D. C.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Sierra Electronic Corp., San Carlos, Calif.
Smuckler & Co., Inc., A. F., 202 Tillary St., Brooklyn 1, N. Y.
Ⓥ SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.
Ⓥ Technical Materiel Corporation, The, 453 West 47th St., New York 19, N. Y.
Ⓥ Transmitter Equipment Co., Inc., 345 Hudson St., New York 14, N. Y.
Ⓥ Wilcox Electric Co., 1400 Chestnut St., Kansas City, Mo.

TRANSMITTERS—*Fixed Station Communication*

Ⓥ Aeronautical Communications Equipment, Inc., 3090 Douglas Rd., Miami 33, Fla.
Ⓥ Audiograph Co., 1414 El Camino Real, San Carlos, Calif.
Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ Bassett Inc., Rex, 307-11 N. W. 1st Ave., Fort Lauderdale, Fla.
Ⓥ Belmont Radio Co., Div. Raytheon Mfg. Co., 5921 W. Dickens Ave., Chicago 39, Ill.
Ⓥ Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ Collins Radio Co., Cedar Rapids, Iowa.
Ⓥ Communications Co., Inc., 300 Greco Ave., Coral Gables 34, Fla.
Ⓥ Cossor (Canada) Ltd., 301-303 Windsor St., Halifax, N. S., Canada.
Ⓥ Doolittle Radio, Inc., 7421 S. Loomis Blvd., Chicago 36, Ill.
Ⓥ EL-TRONICS INC., 2649 No. Howard St., Philadelphia 33, Pa. ADV. PG. 238.
Erco Radio Labs., Inc., East Stewart Ave., Garden City, N. Y.
Ⓥ FEDERAL TELEPHONE AND RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.
Ⓥ Gates Radio Co., Quincy, Ill.
Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
Ⓥ Hallicrafters Co., 4401 W. Fifth Ave., Chicago 24, Ill.
Ⓥ HARVEY RADIO LABS., INC., 447 Concord Ave., Cambridge, Mass. ADV. PG. 104.
Ⓥ Intervox Corp., 2701 California Ave., Seattle 6, Wash.
Ⓥ Kaar Engineering Co., 2995 Middlefield Rd., Palo Alto, Calif.
Ⓥ Link Radio Corp., 125 W. 17th St., New York, N. Y.
Ⓥ Micro-Tron Mfg. Corp., Clinton, Mass.
Ⓥ Maryland Electronic Mfg. Corp., 5009 Calvert Road, College Park, Maryland.
McMurdo Silver Co., 1240 Main St., Hartford 3, Conn.
Ⓥ Northern Radio Co., 314 Bell St., Seattle 1, Wash.
Ⓥ NORTHERN RADIO CO., INC., 143-145 W. 22nd St., New York 11, N. Y. ADV. PG. 132, 133.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Press Wireless Mfg. Co., Inc., Cantiague Rd., Hicksville, L. I., N. Y.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 75. Inside Back and Back Covers.
Radio Specialty Mfg. Co., 2023 S. E. Sixth Ave., Portland 14, Ore.
Ⓥ RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Sierra Electronic Corp., San Carlos, Calif.
Smuckler & Co., Inc., A. F., 202 Tillary St., Brooklyn 1, N. Y.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ Technical Materiel Corporation, The, 453 West 47th St., New York 19, N. Y.
Ⓥ Transmitter Equipment Co., Inc., 345 Hudson St., New York 14, N. Y.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Ⓥ Wilcox Electric Co., 1400 Chestnut St., Kansas City, Mo.

TRANSMITTERS—*Loran*

Ⓥ FEDERAL TELEPHONE AND RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.
Ⓥ HARVEY RADIO LABS., INC., 447 Concord Ave., Cambridge, Mass. ADV. PG. 104.
Ⓥ RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.

TRANSMITTERS—*Marine*

Ⓥ Applied Electronics Co., 124a Folsom St., San Francisco 3, Calif.
Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ Bassett Inc., Rex, 307-11 N. W. 1st Ave., Fort Lauderdale, Fla.
Ⓥ Collins Radio Co., Cedar Rapids, Iowa.
Ⓥ Communications Co., Inc., 300 Greco Ave., Coral Gables 34, Fla.
Ⓥ EL-TRONICS INC., 2649 No. Howard St., Philadelphia 33, Pa. ADV. PG. 238.
Erco Radio Labs. Inc., East Stewart Ave., Garden City, N. Y.
Fisher Research Lab., Inc., 1961 University Ave., Palo Alto, Calif.
Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
Grady Instrument Co., 689 Belmont St., Belmont 78, Mass.
Ⓥ Harvey-Wells Electronics Inc., North St., Southbridge, Mass.
Hose-McCann Telephone Co., Inc., 25th St. & 3rd Ave., Brooklyn 32, N. Y.
Ⓥ Intervox Corp., 2701 California Ave., Seattle 6, Wash.
Ⓥ Jefferson Inc., Ray, 40 E. Merrick Road, Freeport, L. I., N. Y.
Ⓥ Kaar Engineering Co., 2995 Middlefield Rd., Palo Alto, Calif.
Ⓥ Maryland Electronic Mfg. Corp., 5009 Calvert Road, College Park, Maryland.
Ⓥ Northern Radio Co., 314 Bell St., Seattle 1, Wash.
Ⓥ Press Wireless Mfg. Co., Inc., Cantiague Rd., Hicksville, L. I., N. Y.
Ⓥ REEVES-HOFFMAN CORP., 321 Cherry St., Carlisle, Pa. ADV. PG. 32.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ Submarine Signal Div., Raytheon Mfg. Co., Waltham, Mass.
Tayloe Equipment Co., Inc., 120 Greenwich St., New York, N. Y.
Ⓥ Transmitter Equipment Co., Inc., 345 Hudson St., New York 14, N. Y.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Williams Ship Radio Co., 4366 Mentone St., San Diego 7, Calif.

TRANSMITTERS—*Microwave*

Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ Cossor (Canada) Ltd., 301-303 Windsor St., Halifax, N. S., Canada.
Ⓥ Federal Telecommunication Labs., Inc., 500 Washington Ave., Nutley 10, N. J.
Ⓥ FEDERAL TELEPHONE AND RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.
Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
Ⓥ Microwave Equipment Co., Inc., North Caldwell, N. J.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Polarad Electronics Corp., 100 Metropolitan Ave., Brooklyn 11, N. Y.
Ⓥ Press Wireless Mfg. Co., Inc., Cantiague Rd., Hicksville, L. I., N. Y.
Ⓥ RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Smuckler & Co., Inc., A. F., 202 Tillary St., Brooklyn 1, N. Y.
Ⓥ SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ Transmitter Equipment Co., Inc., 345 Hudson St., New York 14, N. Y.
Ⓥ Varian Associates, 99 Washington St., San Carlos, Calif.
Ⓥ Weymouth Instrument Co., 1440 Commercial St., East Weymouth 89, Mass.

TRANSMITTERS—*Portable and Mobile Radiotelephone*

Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ Bassett Inc., Rex, 307-11 N. W. 1st Ave., Fort Lauderdale, Fla.
Ⓥ Belmont Radio Co., Div. Raytheon Mfg. Co., 5921 Dickens Ave., Chicago 39, Ill.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ Capehart-Farnsworth Corp., Fort Wayne, Indiana.
Ⓥ Collins Radio Co., Cedar Rapids, Iowa.
Ⓥ Communications Co. Inc., 300 Greco Ave., Coral Gables 34, Fla.
Ⓥ Doolittle Radio, Inc., 7421 S. Loomis Blvd., Chicago 36, Ill.
Ⓥ EL-TRONICS INC., 2649 No. Howard St., Philadelphia 33, Pa. ADV. PG. 238.
Ⓥ FEDERAL TELEPHONE AND RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.
Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
Grady Instrument Co., 689 Belmont St., Belmont 78, Mass.
Ⓥ Hallicrafters Co., 4401 W. Fifth Ave., Chicago 24, Ill.
Ⓥ HARVEY RADIO LABS., INC., 447 Concord Ave., Cambridge, Mass. ADV. PG. 104.
Ⓥ Kaar Engineering Co., 2995 Middlefield Rd., Palo Alto, Calif.
Ⓥ Kellogg Switchboard & Supply Co., 6650 S. Cicero Ave., Chicago 38, Ill.
Ⓥ Link Radio Corp., 125 W. 17th St., New York, N. Y.
Ⓥ Mitchell Industries, Inc., Camp Wolters, Mineral Wells, Texas.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 75. Inside Back and Back Covers.
Radio Specialty Mfg. Co., 2023 S. E. Sixth Ave., Portland 14, Ore.
Ⓥ Radio Transceiver Labs., 116-23 Jamaica Ave., Richmond Hill 18, N. Y.
Ⓥ RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Smuckler & Co., Inc., A. F., 202 Tillary St., Brooklyn 1, N. Y.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ Transmitter Equipment Co., Inc., 345 Hudson St., New York 14, N. Y.
West Coast Electronics Co., 1601 S. Burlington Ave., Los Angeles 6, Calif.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

TRANSMITTERS—*Pulse Time Modulation*

Applied Science Corp. of Princeton, The, P. O. Box 44, Princeton, N. J.
Ⓥ ELECTRONIC MEASUREMENTS CO., Red Bank, N. J. ADV. PG. 139.
Ⓥ Federal Telecommunication Labs., Inc., 500 Washington Ave., Nutley 10, N. J.
Ⓥ FEDERAL TELEPHONE AND RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.
Ⓥ Molded Insulation Co., Aircraft & Control Div., 335 E. Price St., Philadelphia, Pa.
Ⓥ RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Sierra Electronic Corp., San Carlos, Calif.
Smuckler & Co., Inc., A. F., 202 Tillary St., Brooklyn 1, N. Y.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.

TRANSMITTERS—*Radar*

Ⓥ Air Associates, Inc., Teterboro, N. J.
Ⓥ Airborne Instruments Lab., Inc., 160 Old Country Rd., Mineola, L. I., N. Y.
Ⓥ Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ Cossor (Canada) Ltd., 301-303 Windsor St., Halifax, N. S., Canada.
Ⓥ FEDERAL TELEPHONE AND RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.
Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
Ⓥ Reeves Instrument Corp., 215 E. 91st St., New York, N. Y.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.
Ⓥ Submarine Signal Div., Raytheon Mfg. Co., Waltham, Mass.
Ⓥ Transmitter Equipment Co., Inc., 345 Hudson St., New York 14, N. Y.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

(V) indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

TRANSMITTERS—*Radio Range*

(V)Air Associates, Inc., Teterboro, N. J.
(V)Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
(V)FEDERAL TELEPHONE AND RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.
(V)LAVOIE LABORATORIES, Morganville, N. J. ADV. PG. 151.
(V)Press Wireless Mfg. Co., Inc., Cantiague Rd., Hicksville, L. I., N. Y.
(V)RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Smuckler & Co., Inc., A. F., 202 Tillary St., Brooklyn 1, N. Y.
(V)WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh **30, Pa. ADV. PG. 77.**

TRANSMITTERS—*Railroad*

(V)Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.
(V)Capehart-Farnsworth Corp., Fort Wayne, Indiana.
(V)Communications Co., Inc., 300 Greco Ave., Coral Gables 34, Fla.
(V)RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
(V)WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

TRANSMITTERS—*Television*

(V)DuMont Laboratories, Inc., Allen B., Television Transmitter Div., 1000 Main Ave., Clifton, N. J.
(V)Federal Telecommunication Labs., Inc., 500 Washington Ave., Nutley 10, N. J.
(V)FEDERAL TELEPHONE AND RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.
(V)GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
Jamaica Television Mfg. Co., 95-26 Sutphin Blvd., Jamaica 4, N. Y.
(V)Polarad Electronics Corp., 100 Metropolitan Ave., Brooklyn 11, N. Y.
(V)RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
(V)RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
(V)REEVES-HOFFMAN CORP., 321 Cherry St., Carlisle, Pa. ADV. PG. 32.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
(V)Tv Instrument Co., Inc., 50 Paterson Ave., East Rutherford, N. J.
Television Projects, Inc., 3660 Coral Way, Miami 34, Fla.

TRANSMITTERS—*uhf*

Applied Science Corp. of Princeton, The, P. O. Box 44, Princeton, N. J.
(V)BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
(V)Bendix Aviation Corp., Pacific Division, 11600 Sherman Way, N. Hollywood, Calif.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Communications Co., Inc., 300 Greco Ave., Coral Gables 34, Fla.
(V)EL-TRONICS INC., 2649 No. Howard St., Philadelphia 33, Pa. ADV. PG. 238.
Federal Telecommunication Labs., Inc., 500 Washington Ave., Nutley 10, N. J.
Gates Radio Co., Quincy, Ill.
Jamaica Television Mfg. Co., 95-26 Sutphin Blvd., Jamaica 4, N. Y.
Kear Engineering Co., 2995 Middlefield Rd., Palo Alto, Calif.
Link Radio Corp., 135 W. 17th St., New York, N. Y.
Maryland Electronics Mfg. Corp., 5009 Calvert Road, College Park, Maryland.
McMurdo Silver Co., Inc., 1240 Main St., Hartford 3, Conn.
Press Wireless Mfg. Co., Inc., Cantiague Rd., Hicksville, L. I., N. Y.
(V)RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
(V)RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
Rosen Engineering Products, Inc., Raymond, 32nd & Walnut Sts., Philadelphia 4, Pa.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Sierra Electronic Corp., San Carlos, Calif.
Smuckler & Co., Inc., A. F., 202 Tillary St., Brooklyn 1, N. Y.
(V)SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.
Transmitter Equipment Co., Inc., 345 Hudson St., New York 14, N. Y.
Wilcox Electric Co., 1400 Chestnut St., Kansas City, Mo.

TRANSMITTERS—*vhf*

(V)Aeronautical Communications Equipment, Inc., 3090 Douglas Rd., Miami 33, Fla.
(V)AIRCRAFT RADIO CORP., Boonton, N. J. ADV. PG. 198, 199.
Applied Science Corp. of Princeton, The, P. O. Box 44, Princeton, N. J.
(V)Bendix Aviation Corp., Pacific Division, 11600 Sherman Way, N. Hollywood, Calif.
(V)Bendix Radio Communications Div., Bendix Aviation Corp., Baltimore 4, Md.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
(V)Capehart-Farnsworth Corp., Fort Wayne, Indiana.
(V)Collins Radio Co., Cedar Rapids, Iowa.
(V)Communications Co., 300 Greco Ave., Coral Gables 34, Fla.
(V)Doolittle Radio, Inc., 7421 S. Loomis Blvd., Chicago 36, Ill.
Erie Radio Labs., Inc., East Stewart Ave., Garden City, N. Y.
(V)FEDERAL TELEPHONE & RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.
(V)Gates Radio Co., Quincy, Ill.
(V)GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 5 to 18.
Jamaica Television Mfg. Co., 95-26 Sutphin Blvd., Jamaica 4, N. Y.
(V)Kear Engineering Co., 2995 Middlefield Rd., Palo Alto, Calif.
(V)Lear, Inc., 110 Ionia Ave., N.W., Grand Rapids 2, Mich.
(V)Link Radio Corp., 135 W. 17th St., New York, N. Y.
(V)Maryland Electronic Mfg. Corp., 5009 Calvert Road, College Park, Maryland.
McMurdo Silver Co., Inc., 1240 Main St., Hartford 3, Conn.
(V)Mitchell Industries, Inc., Camp Wolters, Mineral Wells, Texas.
(V)National Electronics Labs., Inc., 1713 Kalorama Rd., N. W., Washington 9, D. C.
(V)Nutley Corp., Tioga & C Sts., Philadelphia 34, Pa.
(V)Press Wireless Mfg. Co., Inc., Cantiague Rd., Hicksville, L. I., N. Y.
(V)RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
(V)RADIO RECEPTOR CO., 251 W. 19th St., New York, N. Y. ADV. PG. 188.
Radio Specialty Mfg. Co., 2023 S. E. 6th Ave., Portland 14, Ore.
(V)RAYTHEON MFG. CO., Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
(V)Rosen Engineering Products, Inc., Raymond, 32nd & Walnut Sts., Philadelphia 4, Pa.
(V)Schuttig & Co., Inc., 9th & Kearney Sts., N. E., Washington 17, D. C.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Sierra Electronic Corp., San Carlos, Calif.
Smuckler & Co., Inc., A. F., 202 Tillary St., Brooklyn 1, N. Y.
(V)Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
(V)Transmitter Equipment Co., Inc., 345 Hudson St., New York 14, N. Y.
(V)WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Wilcox Electric Co., 1400 Chestnut St., Kansas City, Missouri.

TRAPS—*Wave*

(V)BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
(V)Bird Electronic Corp., 1800 Market St., Denver 2, Colorado.
(V)HILLBURN ELECTRONIC PRODUCTS CO., 55 Nassau Ave., Brooklyn 22, N. Y. ADV. PG. 46.
(V)Hinde & Dauch Paper Co., Sandusky, Ohio.
(V)Hinde of Television Inc., 40 W. 4th St., New York 12, N. Y.
(V)Lenkurt Engineers, Inc., 1721 Delancey St., Philadelphia 46, Pa.
Mesaver Mfg. Div., Magnire Industries, Inc., Mt. Carmel, Ill.
(V)Sexton Corp., The, Electronic Division, 196 Albion Ave., Paterson 2, N. J.
(V)Shallcross Mfg. Co., Tioga & C Sts., Philadelphia 34, Pa.
(V)Smith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.
(V)STANDARD COIL PRODUCTS CO., 2329 N. Pulaski Rd., Chicago 39, Ill. ADV. PG. 233.
(V)Televiso Engineering Corp., 99 Wall St., New York, N. Y.

TRIMMER—*Capacitors*

See Capacitors

TUBE PARTS

Anodes, Carbon

(V)NATIONAL CARBON DIVISION, Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y. ADV. PG. 109.
(V)Speer Carbon Co., Lincoln Ave., St. Marys, Pa.
(V)STACKPOLE CARBON CO., St. Marys, Pa. ADV. PG. 166, 167.
SYLVANIA ELECTRIC PRODUCTS, INC., Emporium, Pa., ADV. PG. 286 to 290.

Anodes, Gold

(V)Baker & Co., Inc., 113 Astor St., Newark 5, N. J.
(V)GENERAL PLATE DIVISION, Metals & Controls Corp., Attleboro, Mass. ADV. PG. 245.
(V)JOHNSON & HOFFMAN INC., 65 Ongley St., Rockville Center, L. I., N. Y. ADV. PG. 113.
(V)NEY CO., J. M., 179 Elm St., Hartford, Conn. ADV. PG. 142.
(V)SYLVANIA ELECTRIC PRODUCTS, INC., Emporium, Pa. ADV. PG. 286 to 290.
(V)Wildberg Bros. Smelting & Refining Co., 742 Market St., San Francisco 2, Calif.

Anodes, Graphite

(V)NATIONAL CARBON DIVISION, Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y. ADV. PG. 109.
(V)Speer Carbon Co., Lincoln Ave., St. Marys, Pa.
(V)STACKPOLE CARBON CO., St. Marys, Pa. ADV. PG. 166, 167.
(V)SYLVANIA ELECTRIC PRODUCTS, INC., Emporium, Pa. ADV. PG. 286 to 290.

Anodes, Metal

(V)Aluminum Co. of America, Gulf Bldg., Pittsburgh, Pa.
(V)ART WIRE & STAMPING CO., 227 High St., Newark 2, N. J. ADV. PG. 198.
(V)Eitel-McCullough, Inc., San Bruno, Calif.
Elm Laboratories, 18 South Broadway, Dobbs Ferry, N. Y.
(V)Fansteel Metallurgical Corp., 2200 Sheridan Road, North Chicago, Ill.
(V)FEDERAL TELEPHONE & RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.
(V)JOHNSON & HOFFMAN INC., 65 Ongley St., Rockville Center, L. I., N. Y. ADV. PG. 113.
(V)NEWARK SPINNING & STAMPING CO., 471 Bloy St., Hillside 5, N. J. ADV. PG. 269.
(V)North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
(V)RADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
(V)STAVER CO., INC., 91 Pearl St., Brooklyn 1, N. Y. ADV. PG. 180.
(V)SUPERIOR TUBE CO., 2504 Germantown Pike, Norristown, Pa. ADV. PG. 44, 45.
(V)SYLVANIA ELECTRIC PRODUCTS, INC., Emporium, Pa. ADV. PG. 286 to 290.
(V)United Carr Fastener Corp., Cambridge 42, Mass.
(V)WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

Anodes, Metallized Graphite

(V)Speer Carbon Co., Lincoln Ave., St. Marys, Pa.
(V)SYLVANIA ELECTRIC PRODUCTS, INC., Emporium, Pa. ADV. PG. 286 to 290.

Anodes, Silver

(V)GENERAL PLATE DIVISION, Metals & Controls Corp., Attleboro, Mass. ADV. PG. 245.
(V)JOHNSON & HOFFMAN, INC., 65 Ongley St., Rockville Center, L. I., N. Y. ADV. PG. 113.
(V)NEY CO., J. M., 179 Elm St., Hartford, Conn. ADV. PG. 142.
(V)SYLVANIA ELECTRIC PRODUCTS, INC., Emporium, Pa. ADV. PG. 286 to 290.
(V)Wildberg Bros. Smelting & Refining Co., 742 Market St., San Francisco 2, Calif.

Base Pins

(V)ART WIRE AND STAMPING CO., 22 High Street, Newark 2, N. J. ADV. PG. 198.
(V)Bead Chain Mfg. Co., 110 Mountain Grove St., Bridgeport 4, Conn.
(V)Cinaudagraph Corp., G. G. Warren, Pa.
(V)SYLVANIA ELECTRIC PRODUCTS, INC., Emporium, Pa. ADV. PG. 286 to 290.
(V)WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. **ADV. PG. 77.**

Bases

(V)ALDEN PRODUCTS CO., 117 No. Main St., Brockton 64, Mass. ADV. PG. 235.
(V)AMERICAN LAVA CORP., Chattanooga 5, Tenn. ADV. PG. 31.
(V)Continental Electric Co., Geneva, Ill.
(V)Electronic Mfg. Co., 20 Orange St., Newark, N. J.
Elm Laboratories, 18 South Broadway, Dobbs Ferry, N. Y.
(V)Engineering Co., 27 Wright St., Newark, N. J.
(V)GENERAL CERAMICS & STEATITE CORP., Keasbey, N. J. ADV. PG. 219.

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

ⓋGENERAL ELECTRIC CO., Chemical Dept., Pittsfield, Mass. ADV. PG. 5 to 18.
ⓋGreene Mfg. Corp., G. G., Warren, Pa.
ⓋMolded Insulation Co., Aircraft Control Div., 335 E. Price St., Philadelphia, Pa.
ⓋOwens-Illinois Glass Co., Toledo, Ohio.
ⓋRADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
ⓋShaw Insulator Co., 160 Colt St., Irvington 11, N. J.
ⓋSYLVANIA ELECTRIC PRODUCTS, INC., Emporium, Pa. ADV. PG. 286 to 290.
ⓋThor Ceramics Inc., 225 Belleville Ave., Bloomfield, N. J.
ⓋWESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

Bulbs & Envelopes

ⓋAmerican Structural Products Co., Toledo 1, Ohio.
ⓋCORNING GLASS WORKS, Corning, N. Y. ADV. PG. 134.
Polan Industries, 220 Eighth St., Huntington, W. Va.
ⓋSYLVANIA ELECTRIC PRODUCTS, INC., Emporium, Pa. ADV. PG. 286 to 290.
ⓋZenith Optical Co., Div. of Polan Industries, Huntington 19, W. Va.

Caps

ⓋALDEN PRODUCTS CO., 117 No. Main St., Brockton 64, Mass. ADV. PG. 235.
Eagle Electric Mfg. Co., Inc., 23-10 Bridge Plaza S., Long Island City, N. Y.
ⓋElectronic Mfg. Co., 20 Orange St., Newark, N. J.
Elm Laboratories, 18 South Broadway, Dobbs Ferry, N. Y.
ⓋEngineering Co., 27 Wright St., Newark, N. J.
ⓋGoat Co., Inc., Fred, 314 Dean St., Brooklyn, New York.
ⓋJohnson Co., E. F., Waseca, Minn.
ⓋJOHNSON & HOFFMAN, INC., 65 Ongley St., Rockville Center, L. I., N. Y. ADV. PG. 113.
ⓋSYLVANIA ELECTRIC PRODUCTS, INC., Emporium, Pa. ADV. PG. 286 to 290.

Cathode Ray Tube Powders

ⓋDu Pont de Nemours & Co., Inc., E. I., Patterson Screen Div., Towanda, Pa.
ⓋRADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
ⓋSYLVANIA ELECTRIC PRODUCTS, INC., Emporium, Pa. ADV. PG. 286 to 290.
ⓋU. S. Radium Corp., 535 Pearl St., New York 7, N. Y.

Cathode Ray Tube Side Contacts

ⓋRADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
ⓋSYLVANIA ELECTRIC PRODUCTS, INC., Emporium, Pa. ADV. PG. 286 to 290.

Cathode Sleeves and Tubes

ⓋNEWARK SPINNING & STAMPING CO., 471 Bloy St., Hillside 5, N. J. ADV. PG. 269.
ⓋRADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
ⓋSuperior Tube Co., 2604 Germantown Pike, Norristown, Pa. ADV. PG. 44-45.
ⓋSYLVANIA ELECTRIC PRODUCTS, INC., Emporium, Pa. ADV. PG. 286 to 290.

Conductive Paints

See Paints, Conductive

Filament Wire

ⓋAlloy Metal Wire Co., 13th & Penna. Ave., Prospect Park, Pa.
ⓋCOHN CORP., SIGMUND, 44 Gold St., New York, N. Y. ADV. PG. 176.
ⓋDRIVER CO., WILBUR B., 150 Riverside Ave., Newark 4, N. J. ADV. PG. 123.
ⓋEisler Engineering Co., Inc., 740 S. 13th St., Newark 7, N. J.
ⓋNorth American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
ⓋRADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
ⓋSYLVANIA ELECTRIC PRODUCTS, INC., Emporium, Pa. ADV. PG. 286 to 290.
ⓋWESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
ⓋWildberg Bros. Smelting & Refining Co., 742 Market St., San Francisco 2, Calif.

Getters

ⓋFansteel Metallurgical Corp., 2200 Sheridan Rd., North Chicago, Ill.
ⓋKemet Division, Union Carbide & Carbon Corp., Madison Ave. & 117th St., Cleveland 1, Ohio.
ⓋKing Laboratories Inc., 127 Solar St., Syracuse 4, N. Y.
ⓋNorth American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
ⓋRADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.

Grids and Supports

ⓋART WIRE & STAMPING CO., 227 High St., Newark 2, N. J. ADV. PG. 198.
Elm Laboratories, 18 South Broadway, Dobbs Ferry, N. Y.
ⓋGoat Co., Inc., Fred, 314 Dean St., Brooklyn, N. Y.
ⓋHaydu Brothers, Plainfield, N. J.
ⓋJOHNSON & HOFFMAN, INC., 65 Ongley St., Rockville Center, L. I., N. Y. ADV. PG. 113.
ⓋNATIONAL CARBON DIVISION, Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y. ADV. PG. 109.
ⓋNEWARK SPINNING & STAMPING CO., 471 Bloy St., Hillside 5, N. J. ADV. PG. 269.
ⓋNorth American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
ⓋSYLVANIA ELECTRIC PRODUCTS, INC., Emporium, Pa. ADV. PG. 286 to 290.
ⓋWESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

Grid Wire

ⓋAlloy Metal Wire Co., 13th & Penna. Ave., Prospect Park, Pa.
ⓋDRIVER CO., WILBUR B., 150 Riverside Ave., Newark 4, N. J. ADV. PG. 123.
ⓋDRIVER-HARRIS CO., 201 Middlesex St., Harrison, N. J. ADV. PG. 117.
ⓋEisler Engineering Co., Inc., 740 S. 13th St., Newark 7, N. J.
ⓋFitel-McCullough Inc., San Bruno, Calif.
ⓋFansteel Metallurgical Corp., 2200 Sheridan Rd., North Chicago, Ill.
ⓋKemet Division, Union Carbide & Carbon Corp., Madison Ave. & 117th St., Cleveland 1, Ohio.
ⓋNorth American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
ⓋRADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
ⓋSYLVANIA ELECTRIC PRODUCTS, INC., Emporium, Pa. ADV. PG. 286 to 290.
ⓋWESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
ⓋWildberg Bros. Smelting & Refining Co., 742 Market St., San Francisco 2, Calif.

Heat Radiators

ⓋFitel-McCullough, Inc., San Bruno, Calif.
ⓋFEDERAL TELEPHONE AND RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.
ⓋJOHNSON & HOFFMAN, INC., 65 Ongley St., Rockville Center, L. I., N. Y. ADV. PG. 113.
ⓋSYLVANIA ELECTRIC PRODUCTS, INC., Emporium, Pa. ADV. PG. 286 to 290.
ⓋWESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

Metal Supports

ⓋART WIRE AND STAMPING CO., 227 High St., Newark 2, N. J. ADV. PG. 198.
ⓋCleveland Tungsten, Inc., 10200 Meech Ave., Cleveland, Ohio.
ⓋElectronic Mfg. Co., 20 Orange St., Newark, N. J.
Elm Laboratories, 18 South Broadway, Dobbs Ferry, N. Y.
ⓋFansteel Metallurgical Corp., 2200 Sheridan Rd., North Chicago, Ill.
ⓋGoat Co., Inc., Fred, 314 Dean St., Brooklyn, N. Y.
ⓋGreene Mfg. Corp., G. G., Warren, Pa.
ⓋHaydu Brothers, Plainfield, N. J.
ⓋJOHNSON & HOFFMAN, INC., 65 Ongley St., Rockville Center, L. I., N. Y. ADV. PG. 113.
ⓋNEWARK SPINNING & STAMPING CO., 471 Bloy St., Hillside 5, N. J. ADV. PG. 269.
ⓋNorth American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
ⓋRADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
ⓋSTAVER CO., INC., 91 Pearl St., Brooklyn 1, N. Y. ADV. PG. 180.
ⓋSYLVANIA ELECTRIC PRODUCTS, INC., Emporium, Pa. ADV. PG. 286 to 290.
ⓋWESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

Mica Supports

ⓋJOHNSON & HOFFMAN, INC., 65 Ongley St., Rockville Center, L. I., N. Y. ADV. PG. 113.
Mica Fabricating Co., 53 Central Ave., Rochelle Park, N. J.
ⓋMICA INSULATOR CO., Schenectady 1, N. Y. ADV. PG. 232.
ⓋMicacraft Products Inc., 701 McCarter Highway, Newark 5, N. J.
ⓋSYLVANIA ELECTRIC PRODUCTS, INC., Emporium, Pa. ADV. PG. 286 to 290.

Tube Seal Leads

ⓋCleveland Tungsten, Inc., 10200 Meech Ave., Cleveland 5, Ohio.
ⓋEisler Engineering Co., Inc., 740 S. 13th St., Newark 7, N. J.
ⓋEngineering Co., 27 Wright St., Newark, N. J.
ⓋFansteel Metallurgical Corp., 2200 Sheridan Rd., Chicago, Ill.
ⓋHERMETIC SEAL PRODUCTS CO., 29-37 South 6th St., Newark 7, N. J. ADV. PG. 87.
ⓋNATIONAL ELECTRONICS, INC., Geneva, Illinois. ADV. PG. 100.
ⓋNorth American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
ⓋSYLVANIA ELECTRIC PRODUCTS, INC., Emporium, Pa. ADV. PG. 286 to 290.
ⓋWESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

Water Jackets

ⓋAmperex Electronic Corp., 25 Washington St., Brooklyn 1, N. Y.
ⓋFEDERAL TELEPHONE AND RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.
ⓋMaclett Laboratories, Springdale, Conn.
ⓋRADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
ⓋROTRON MFG. CO., INC., 7-9 Schoonmaker Lane, Woodstock, N. Y. ADV. PG. 260.

Wire Parts

ⓋART WIRE AND STAMPING CO., 227 High St., Newark 2, N. J. ADV. PG. 198.
ⓋCleveland Tungsten, Inc., 10200 Meech Ave., Cleveland, Ohio.
ⓋElectronic Mfg. Co., 20 Orange St., Newark, N. J.
Elm Laboratories, 18 South Broadway, Dobbs Ferry, N. Y.
ⓋGoat Co., Inc., Fred, 314 Dean St., Brooklyn, N. Y.
ⓋHaydu Brothers, Plainfield, N. J.
ⓋJudd Co., H. L., 87 Chambers St., New York 7, N. Y.
ⓋNorth American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
ⓋRADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
ⓋSURPRENANT MFG. CO., 199 Washington St., Boston 10, Mass. ADV. PG. 229.
ⓋSYLVANIA ELECTRIC PRODUCTS, INC., Emporium, Pa. ADV. PG. 286 to 290.
ⓋWESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

TUBES—Ballast

ⓋAMPERITE CO., 561 Broadway, New York 12, N. Y. ADV. PG. 218.
ⓋElectronic Enterprises, Inc., 65 7th Ave., Newark 4, N. J.
ⓋGENERAL ELECTRIC CO., Electronics Dept., Tube Div., Schenectady 5, N. Y. ADV. PG. 5 to 18.
ⓋJ F D MFG. CO., 6101-23 Sixteenth Ave., Brooklyn, N. Y. ADV. PG. 264, 264.
ⓋNorth American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
ⓋPhilco Corp., Tioga & C Sts., Philadelphia 34, Pa.
ⓋStandard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
ⓋTUNG-SOL LAMP WORKS INC., 95 Eighth Ave., Newark 4, N. J. ADV. PG. 38.

TUBES—Battery Charger

ⓋBuilder Electric Co., 4353 Duncan Ave., St. Louis, Mo.
ⓋContinental Electric Co., Geneva, Ill.
ⓋElectric Heat Control Co., The, 9123 Inman Ave., Cleveland 5, Ohio.
ⓋELECTRONS, INC., 127 Sussex Ave., Newark 4, N. J. ADV. PG. 255.
ⓋMcColpin-Christie Corp., 4922 S. Figueroa St., Los Angeles 37, Calif.
ⓋNATIONAL ELECTRONICS, INC., Geneva, Ill. ADV. PG. 100.
ⓋStandard Arcturus Corp., 54 Clark St., Newark 4, N. J.
ⓋWESTINGHOUSE ELECTRIC CORP., Electronic Tube Sales Dept., Bloomfield, N. J. ADV. PG. 78, 79.

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

TUBES—*Bolometer*

Aerolux Light Corp., 653 11th Ave., New York 19, N. Y.
Ⓥ SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.

TUBES—*Cathode Ray*

Ⓥ Acheson Colloids Corp., Port Huron, Mich.
Ⓥ Arcturus Electronics, Inc., 54 Clark St., Newark, N. J.
Ⓥ Capehart-Farnsworth Corp., Fort Wayne, Indiana.
Ⓥ Canadian Canadian Ltd., 301-303 Windsor St., Halifax, N. S., Canada.
Ⓥ DuMont Laboratories, Inc., Allen B., Instrument Div., 1000 Main Ave., Clifton, N. J.
Ⓥ ELECTRONIC TUBE CORP., 1200 E. Mermaid Ave., Philadelphia 18, Pa. ADV. PG. 176.
Eureka Television & Tube Corp., 69 Fifth Ave., Hawthorne, N. J.
Ⓥ Guardian Electronics Corp., 614 W. 51st St., New York 19, N. Y.
Ⓥ Hytron Brothers, Plainfield, N. J.
Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Tube Div., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ GENERAL ELECTRONICS, INC., 101 Hazel St., Paterson, N. J. ADV. PG. 265.
Ⓥ Lansdale Tube Co., Church Rd., Lansdale, Pa.
Ⓥ National Union Radio Corp., 350 Scotland Rd., Orange, N. J.
Ⓥ North American Philips Co., 100 East 42nd St., New York 17, N. Y.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75. Inside Back and Back Covers.
Ⓥ RAYTHEON MFG. CO., Receiving & Special Tube Div., 55 Chapel St., Newton 58, Mass. ADV. PG. 257.
Ⓥ Sarkes Tarzian Inc., 415 N. College Ave., Bloomington, Ind.
Ⓥ Sheldon Electric Co., 76-86 Colt St., Irvington, N. J.
Ⓥ Standard Arcturus Corp., 54 Clark St., Newark 4, N. J.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ SYLVANIA ELECTRIC PRODUCTS, INC., 1740 Broadway, New York 19, N. Y. ADV. PG. 286 to 290.
Ⓥ Taylor Tubes, Inc., 2312 Wabansia Ave., Chicago 47, Ill.
Ⓥ TEL-O-TUBE CORP. OF AMERICA, Paterson, N. J. ADV. PG. 267.
Ⓥ THOMAS ELECTRONICS, INC., 118 9th St., Passaic, N. J. ADV. PG. 216.
Ⓥ Transvision, Inc., 46a North Ave., New Rochelle, N. Y.
Ⓥ TUNG-SOL LAMP WORKS, INC., 95 Eighth Ave., Newark 4, N. J. ADV. PG. 38.
Ⓥ Vacuum Tube Products, 302 North Clementine St., Oceanside, Calif.
Ⓥ WATERMAN PRODUCTS CO., INC., 2445-63 Emerald St., Philadelphia 25, Pa. ADV. PG. 252.
Ⓥ Zetka Television Tubes, Inc., 131-37 Getty Ave., Clifton, N. J.

TUBES—*Detector*

Ⓥ Canadian Canadian Ltd., 301-303 Windsor St., Halifax, N. S., Canada.
Ⓥ Electronic Products Co., 111 E. 3rd St., Mt. Vernon, N. Y.
Ⓥ National Union Radio Corp., 350 Scotland Rd., Orange, N. J.
Ⓥ North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75. Inside Back and Back Covers.
Ⓥ RAYTHEON MFG. CO., Receiving & Special Tube Div., 55 Chapel St., Newton 58, Mass. ADV. PG. 257.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ SYLVANIA ELECTRIC PRODUCTS, INC., Emporium, Pa. ADV. PG. 286 to 290.

TUBES—*Electrometer*

Ⓥ Canadian Canadian Ltd., 301-303 Windsor St., Halifax, N. S., Canada.
Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Tube Div., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Heintz & Kaufman Div. of The Robert Dollar Co., 947 Broadway, Redwood City, Calif.
Ⓥ RAYTHEON MFG. CO., Receiving & Special Tube Div., 55 Chapel St., Newton 58, Mass. ADV. PG. 257.
Ⓥ Resistance Corp., P. O. Box 200, Saw Mill River Rd., Elmsford, N. Y.
Ⓥ VICTOREEN INSTRUMENT CO., 5806 Hough Ave., Cleveland 3, Ohio. ADV. PG. 241.
Ⓥ WESTINGHOUSE ELECTRIC CORP., Electronic Tube Sales Dept., Bloomfield, N. J. ADV. PG. 78, 79.

TUBES—*Geiger*

Aerolux Light Corp., 653 11th Ave., New York 19, N. Y.
Ⓥ Amperex Electronic Corp., 25 Washington St., Brooklyn 1, N. Y.
Ⓥ Anton Electronic Laboratories, Inc., 1226-1238 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ BALLANTINE LABORATORIES, INC., Boonton, N. J. ADV. PG. 96.
Ⓥ Cyclotron Specialties Co., Moraga 8, Calif.
Ⓥ Distillation Products Industries, Vacuum Equipt. Div., 755 Ridge Road West, Rochester 3, N. Y.
Ⓥ ECLIPSE-PIONEER DIV., Bendix Aviation Corp., Teterboro, N. J. ADV. PG. 176.
Electronic Products Co., 111 E. 3rd St., Mt. Vernon, N. Y.
Ⓥ EL-TRONICS, INC., 2649 No. Howard St., Philadelphia 33, Pa. ADV. PG. 238.
Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 46, 47.
Ⓥ Geophysical Instrument Co., 1870 N. Nash St., Arlington, Va.
Ⓥ Guardian Electronics Corp., 614 W. 51st St., New York 19, N. Y.
Harshaw Scientific Div. of The Harshaw Chemical Co., 1945 E. 97th St., Cleveland 6, Ohio.
Ⓥ Kelley-Koett Mfg. Co., Instrument Div., 12 E. 6th St., Covington, Ky.
Ⓥ Manufacturers Engr. & Equip. Corp., Willow Grove, Pa.
Ⓥ North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
Ⓥ Nuclear Development Lab., P. O. Box 7034, Kansas City, Mo.
Ⓥ Nuclear Instrument & Chemical Corp., 223 W. Erie St., Chicago 10, Ill.
Ⓥ Nucleonic Corp. of America, The, 497 Union St., Brooklyn 31, N. Y.
Ⓥ Omaha Scientific Supply Co., 3601 N. 24th St., Omaha 10, Neb.
Ⓥ Radiation Counter Laboratories, Inc., 1844 W. 21st St., Chicago 8, Ill.
Ⓥ RAYTHEON MFG. CO., Receiving & Special Tube Div., 55 Chapel St., Newton 58, Mass. ADV. PG. 257.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ SYLVANIA ELECTRIC PRODUCTS, INC., 1740 Broadway, New York 19, N. Y. ADV. PG. 286 to 290.
Ⓥ Technical Associates, 3730 San Fernando Rd., Glendale 4, Calif.
Ⓥ Tracerlab, Inc., 130 High St., Boston 10, Mass.
Ⓥ VICTOREEN INSTRUMENT CO., 5806 Hough Ave., Cleveland 3, Ohio. ADV. PG. 241.
Ⓥ WESTINGHOUSE ELECTRIC CORP., Electronic Tube Sales Dept., Bloomfield, N. J. ADV. PG. 78, 79.

TUBES—*Germicidal*

Aerolux Light Corp., 653 11th Ave., New York 19, N. Y.
Ⓥ GENERAL ELECTRIC CO., Lamp Dept., Nela Park, Cleveland 12, Ohio. ADV. PG. 5 to 18.
Ⓥ Guardian Electronics Corp., 614 W. 51st St., New York 19, N. Y.
Ⓥ Kemnite Labs., 1819 W. Grand Ave., Chicago 22, Ill.
Shannon Luminous Materials Co., 7356 Santa Monica Blvd., Hollywood 46, Calif.
Sperti Inc., Cincinnati, Ohio.
Ultra-Violet Products, Inc., 145 Pasadena Ave., S. Pasadena, Calif.
Ⓥ WESTINGHOUSE ELECTRIC CORP., Electronic Tube Sales Dept., Bloomfield, N. J. ADV. PG. 78, 79.

TUBES—*Hearing Aid*

Ⓥ Amperex Electronic Corp., 25 Washington St., Brooklyn 1, N. Y.
Globe Phone Mfg. Co., 2 Linden St., Reading, Mass.
Precision Tube Co., Inc., 1828 Terrace St., Philadelphia 30, Pa.
Ⓥ RAYTHEON MFG. CO., Receiving & Special Tube Div., 55 Chapel St., Newton 58, Mass. ADV. PG. 257.
Ⓥ Sonotone Corp., P. O. Box 200, Saw Mill River Rd., Elmsford, N. Y.
Ⓥ Standard Arcturus Corp., 54 Clark St., Newark 4, N. J.
Ⓥ SYLVANIA ELECTRIC PRODUCTS, INC., Emporium, Pa. ADV. PG. 286 to 290.

TUBES—*Industrial*

Ⓥ Amperex Electronic Corp., 25 Washington St., Brooklyn 1, N. Y.
Ⓥ Continental Electric Co., Geneva, Ill.
Ⓥ Canadian (Canada) Ltd., 301-303 Windsor St., Halifax, N. S., Canada.
Ⓥ ECLIPSE-PIONEER DIV., Bendix Aviation Corp., Teterboro, N. J. ADV. PG. 176.
Ⓥ Eitel-McCullough Inc., San Bruno, Calif.
Ⓥ Electronic Enterprises Inc., 65-7th Ave., Newark 4, N. J.
Ⓥ ELECTRONS, INC., 127 Sussex Ave., Newark 4, N. J. ADV. PG. 255.
Ⓥ FEDERAL TELEPHONE AND RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.
Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Tube Div., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Guardian Electronics Corp., 614 W. 51st St., New York 19, N. Y.
Ⓥ Heintz & Kaufman Div. of The Robert Dollar Co., 947 Broadway, Redwood City, Calif.
Instantite Mfg. Corp., Sterling, N. J.
Kip Electronics Corp., 155 Waverly Place, New York 14, N. Y.
Ⓥ Kuthe Laboratories, 150 Summit St., Newark 4, N. J.
Ⓥ Machlett Laboratories, Springdale, Conn.
Ⓥ NATIONAL ELECTRONICS, INC., Geneva, Ill. ADV. PG. 100.
Ⓥ National Union Radio Corp., 350 Scotland Rd., Orange, N. J.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75. Inside Back and Back Covers.
Ⓥ RAYTHEON MFG. CO., Receiving & Special Tube Div., 55 Chapel St., Newton 58, Mass. ADV. PG. 257.
Ⓥ Standard Arcturus Corp., 54 Clark St., Newark 4, N. J.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ Taylor Tubes, Inc., 2312 Wabansia Ave., Chicago 47, Ill.
Ⓥ United Electronics Co., 42 Spring St., Newark 2, N. J.
Ⓥ WESTINGHOUSE ELECTRIC CORP., Electronic Tube Sales Dept., Bloomfield, N. J. ADV. PG. 78, 79.

TUBES—*Klystron*

Bomac Laboratories, Beverly, Mass.
Ⓥ ECLIPSE-PIONEER DIV., Bendix Aviation Corp., Teterboro, N. J. ADV. PG. 176.
Ⓥ FEDERAL TELEPHONE AND RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.
Lewis & Kaufman, Inc., P. O. Box 337, 90 El Rancho Ave., Los Gatos, Calif.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75. Inside Back and Back Covers.
Ⓥ RAYTHEON MFG. CO., Power Tube Div., Waltham 54, Mass. ADV. PG. 257.
Ⓥ SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.
Ⓥ Standard Arcturus Corp., 54 Clark St., Newark 4, N. J.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ SYLVANIA ELECTRIC PRODUCTS, INC., 1740 Broadway, New York 19, N. Y. ADV. PG. 286 to 290.
Ⓥ Varian Associates, 99 Washington St., San Carlos, Calif.

TUBES—*magnetron*

Ⓥ Amperex Electronic Corp., 25 Washington St., Brooklyn 1, N. Y.
Ⓥ Anton Electronic Laboratories, Inc., 1226-1238 Flushing Ave., Brooklyn 6, N. Y.
Bomac Laboratories, Beverly, Mass.
Ⓥ FEDERAL TELEPHONE AND RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.
Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Tube Div., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Guardian Electronics Corp., 614 W. 51st St., New York 19, N. Y.
Ⓥ Litton Industries, San Carlos, Calif.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75. Inside Back and Back Covers.
Ⓥ RAYTHEON MFG. CO., Power Tube Div., Waltham 54, Mass. ADV. PG. 257.
Ⓥ Standard Arcturus Corp., 54 Clark St., Newark 4, N. J.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ SYLVANIA ELECTRIC PRODUCTS, INC., 1740 Broadway, New York 19, N. Y. ADV. PG. 286 to 290.

TUBES—*Mass Spectrometer*

Ⓥ Manufacturers Engr. & Equip. Corp., Willow Grove, Pa.
Process & Instruments, 60 Greenpoint Ave., Brooklyn 22, N. Y.
Ⓥ Vacuum Electronic Engineering Co., 316 37th St., Brooklyn 2, N. Y.

TUBES—*Microwave Receiving or Transmitting*

Ⓥ Amperex Electronic Corp., 25 Washington St., Brooklyn 1, N. Y.
Bomac Laboratories, Beverly, Mass.
Ⓥ ECLIPSE-PIONEER DIV., Bendix Aviation Corp., Teterboro, N. J. ADV. PG. 176.
Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Tube Div., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Kent Co., F. C., 44-72 Howard St., Irvington, N. J.
Ⓥ Kuthe Laboratories, Inc., 150 Summit St., Newark 4, N. J.
Lewis & Kaufman, Inc., P. O. Box 337, 90 El Rancho Ave., Los Gatos, Calif.
Ⓥ Litton Industries, San Carlos, Calif.
Ⓥ National Union Radio Corp., 350 Scotland Rd., Orange, N. J.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75. Inside Back and Back Covers.
Ⓥ RAYTHEON MFG. CO., Power Tube Div., Waltham 54, Mass. ADV. PG. 257.
Ⓥ SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ SYLVANIA ELECTRIC PRODUCTS, INC., 1740 Broadway, New York 19, N. Y. ADV. PG. 286 to 290.
Ⓥ TUNG-SOL LAMP WORKS, INC., 95 Eighth Ave., Newark 4, N. J. ADV. PG. 38.
Ⓥ Varian Associates, 99 Washington St., San Carlos, Calif.
Ⓥ WESTINGHOUSE ELECTRIC CORP., Electronic Tube Sales Dept., Bloomfield, N. J. ADV. PG. 78, 79.

TUBES—*Phototubes and Photocells*

Ⓥ American Scientific Co., P. O. Box 1, Highbridge Station, New York 52, N. Y.
Ⓥ Anton Electronic Laboratories, Inc., 1226-1238 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ Continental Electric Co., Geneva, Ill.
Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Tube Div., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ INSTRUMENT DEVELOPMENT LABORATORIES, INC., Needham Heights, Mass. ADV. PG. 249.
Ⓥ Photobell Company, 116 Nassau St., New York 7, N. Y.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
R. Rey Co., Inc., P. O. Box 31, Middletown, Conn.
Ⓥ Standard Arcturus Corp., 54 Clark St., Newark 4, N. J.
Ⓥ WESTINGHOUSE ELECTRIC CORP., Electronics Tube Sales Dept., Bloomfield, N. J. ADV. PG. 78, 79.
Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

TUBES—*Pirani*

Ⓥ Distillation Products Industries, Vacuum Equipment Div., 755 Ridge Rd., W., Rochester 3, N. Y.
Ⓥ ECLIPSE-PIONEER DIV., Bendix Aviation Corp., Teterboro, N. J. ADV. PG. 176.
Ⓥ Freedricks Co., Geo. E., Bethayres, Pa.
Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Tube Div., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Heintz & Kaufman, Div. of The Robert Dollar Co., 947 Broadway, Redwood City, Calif.
Ⓥ Manufacturers Engr. & Equip. Corp., Willow Grove, Pa.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
Ⓥ SYLVANIA ELECTRIC PRODUCTS, INC., 1740 Broadway, New York 19, N. Y. ADV. PG. 286 to 290.
Ⓥ Vacuum Tube Products, 302 N. Clementine St., Oceanside, Calif.
Ⓥ WESTINGHOUSE ELECTRIC CORP., Electronic Tube Sales Dept., Bloomfield, N. J. ADV. PG. 78, 79.

TUBES—*Quartz* (for Short Wave Medical Apparatus)

Dalins Labs., 5066 Santa Monica Blvd., Los Angeles, Calif.
Hanovia Chemical & Mfg. Co., 233 N. J. R. R. Ave., Newark, N. J.
Ⓥ Kemlite Labs., 1819 W. Grand Ave., Chicago 22, Ill.
Ⓥ Thermal Syndicate Ltd., 12 E. 46th St., New York 17, N. Y.
Ultra-Violet Products, Inc., 145 Pasadena Ave., S. Pasadena, Calif.

TUBES—*Receiving*

Ⓥ Amperex Electronic Corp., 25 Washington St., Brooklyn 1, N. Y.
Ⓥ Cossor (Canada) Ltd., 301-303 Windsor St., Halifax, N. S., Canada.
Ⓥ ECLIPSE-PIONEER DIV., Bendix Aviation Corp., Teterboro, N. J. ADV. PG. 176.
Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Tube Div., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Hytron Radio & Electronics Corp., 76 Lafayette St., Salem, Mass.
Ⓥ National Union Radio Corp., 350 Scotland Rd., Orange, N. J.
Ⓥ North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
Ⓥ RAYTHEON MFG. CO., Receiving & Special Tube Div., 55 Chapel St., Newton 58, Mass. ADV. PG. 257.
Ⓥ Standard Arcturus Corp., 54 Clark St., Newark 4, N. J.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ SYLVANIA ELECTRIC PRODUCTS, INC., Emporium, Pa. ADV. PG. 286 to 290.
Ⓥ TUNG-SOL LAMP WORKS INC., 95 Eighth Ave., Newark 4, N. J. ADV. PG. 38.
Ⓥ WESTINGHOUSE ELECTRIC CORP., Electronic Tube Sales Dept., Bloomfield, N. J. ADV. PG. 78, 79.

TUBES—*Rectifying*

Ⓥ Amperex Electronic Corp., 25 Washington St., Brooklyn 1, N. Y.
Ⓥ CHATHAM ELECTRONICS CORP., 475 Washington St., Newark 2, N. J. ADV. PG. 126.
Ⓥ Continental Electric Co., Geneva, Ill.
Ⓥ Cossor (Canada) Ltd., 301-303 Windsor St., Halifax, N. S., Canada.
Ⓥ ECLIPSE-PIONEER DIV., Bendix Aviation Corp., Teterboro, N. J. ADV. PG. 176.
Ⓥ Eitel-McCullough, Inc., San Bruno, Calif.
Ⓥ Electronic Enterprises Inc., 65 7th Ave., Newark 4, N. J.
Ⓥ ELECTRONS INC., 127 Sussex Ave., Newark 4, N. J. ADV. PG. 255.
Ⓥ FEDERAL TELEPHONE AND RADIO CORP., 100 Kingsland Rd., Clinton, N. J. ADV. PG. 23 to 25.
Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Tube Div., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ GENERAL ELECTRONICS, INC., 101 Hazel St., Paterson, N. J. ADV. PG. 265.
Ⓥ Guardian Electronics Corp., 614 W. 51st St., New York 19, N. Y.
Ⓥ Heintz & Kaufman, Div. of The Robert Dollar Co., 947 Broadway, Redwood City, Calif.
Ⓥ Hytron Radio & Electronics Corp., 76 Lafayette St., Salem, Mass.
Ⓥ Kuthe Laboratories, Inc., 150 Summit St., Newark 4, N. J.
Ⓥ McColpin-Christie Corp., 4922 S. Figueroa St., Los Angeles 37, Calif.
Ⓥ Machlett Laboratories, Springdale, Conn.
Ⓥ NATIONAL ELECTRONICS, INC., Geneva, Ill. ADV. PG. 100.
Ⓥ National Union Radio Corp., 350 Scotland Rd., Orange, N. J.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
Ⓥ RAYTHEON MFG. CO., Receiving & Special Tube Div., 55 Chapel St., Newton 58, Mass. ADV. PG. 257.
Ⓥ Sheldon Electric Co., 76-86 Coit St., Irvington, N. J.
Ⓥ Standard Arcturus Corp., 54 Clark St., Newark 4, N. J.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ SYLVANIA ELECTRIC PRODUCTS, INC., Emporium, Pa. ADV. PG. 286 to 290.
Ⓥ Taylor Tubes, Inc., 2312 Wabansia Ave., Chicago 47, Ill.
Ⓥ TUNG-SOL LAMP WORKS INC., 95 Eighth Ave., Newark 4, N. J. ADV. PG. 38.
Ⓥ United Electronics Co., 42 Spring St., Newark 2, N. J.
Ⓥ WESTINGHOUSE ELECTRIC CORP., Electronic Tube Sales Dept., Bloomfield, N. J. ADV. PG. 78, 79.

TUBES—*Sonic Gas-Filled*

Aerolux Light Corp., 653 11th Ave., New York 19, N. Y.
Bomac Laboratories, Beverly, Mass.
Ⓥ Guardian Electronics Corp., 614 W. 51st St., New York 19, N. Y.

TUBES—*Strobotron*

Aerolux Light Corp., 653 11th Ave., New York 19, N. Y.
Bomac Laboratories, Beverly, Mass.
Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Ⓥ Kemlite Labs., 1819 W. Grand Ave., Chicago 22, Ill.
Ⓥ North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
Ⓥ Standard Arcturus Corp., 54 Clark St., Newark 4, N. J.
Ⓥ SYLVANIA ELECTRIC PRODUCTS, INC., 1740 Broadway, New York 19, N. Y. ADV. PG. 286 to 290.

TUBES—*Subminiature*

Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
Ⓥ RAYTHEON MFG. CO., Receiving & Special Tube Div., 55 Chapel St., Newton 58, Mass. ADV. PG. 247.
Ⓥ Sonotone Corp., P. O. Box 200, Saw Mill River Rd., Elmsford, N. Y.
Ⓥ Standard Arcturus Corp., 54 Clark St., Newark 4, N. J.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ SYLVANIA ELECTRIC PRODUCTS, INC., 1740 Broadway, New York 19, N. Y. ADV. PG. 286 to 290.
Ⓥ TUNG-SOL LAMPS INC., 95 Eighth Ave., Newark 4, N. J. ADV. PG. 38.
Ⓥ VICTOREEN INSTRUMENT CO., 5806 Hough St., Cleveland 3, Ohio. ADV. PG. 241.

TUBES—*Television*

See Tubes, Cathode Ray

TUBES—*Television Pickup*

Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., Tube Div., Harrison, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
Ⓥ Remington Rand, Inc., Vericon Dept., 315 4th Ave., New York, N. Y.

TUBES—*Television Picture*

American Television, Inc., 523 S. Plymouth St., Chicago 6, Ill.
Ⓥ Arcturus Electronics, Inc., 54 Clark St., Newark, N. J.
Ⓥ DuMont Laboratories, Inc., Allen B. Tube Div. & General Offices, 750 Bloomfield Ave., Clifton, N. J.
Ⓥ Eitel-McCullough, Inc., San Bruno, Calif.
Ⓥ Electronic Engineering Corp., 624 Ridge Rd., Lyndhurst, N. J.
Ⓥ Eureka Television & Tube Corp., 69 Fifth Ave., Hawthorne, N. J.
Ⓥ FEDERAL TELEPHONE & RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.
Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Tube Div., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ GENERAL ELECTRONICS, INC., 101 Hazel St., Paterson, N. J. ADV. PG. 265.
Ⓥ Guardian Electronics Corp., 614 W. 51st St., New York 19, N. Y.
Ⓥ Haydu Brothers, Plainfield, N. J.
Ⓥ Hytron Radio & Electronics Corp., 76 Lafayette St., Salem, Mass.
Ⓥ National Union Radio Corp., 350 Scotland Rd., Orange, N. J.
Ⓥ National Video Corp., 3019 W. 47th St., Chicago, Ill.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
Ⓥ Rauland Corp., 4545 N. Knox Ave., Chicago 41, Ill.
Ⓥ RAYTHEON MFG. CO., Receiving & Special Tube Div., 55 Chapel St., Newton 58, Mass. ADV. PG. 257.
Ⓥ Sheldon Electric Co., 76-86 Coit St., Irvington, N. J.
Ⓥ Standard Arcturus Co., 54 Clark St., Newark 4, N. J.
Ⓥ SYLVANIA ELECTRIC PRODUCTS, INC., 1740 Broadway, New York 19, N. Y. ADV. PG. 286 to 290.
Ⓥ TEL-O-TUBE CORP. OF AMERICA, Paterson, N. J. ADV. PG. 267.
Ⓥ TUNG-SOL LAMP WORKS INC., 95 Eighth Ave., Newark 4, N. J. ADV. PG. 38.
Ⓥ Vacuum Tube Products, 302 North Clementine St., Oceanside, Calif.

TUBES—*Television Projection*

Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Tube Div., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ National Union Radio Corp., 350 Scotland Rd., Orange, N. J.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
Ⓥ Vacuum Tube Products, 302 N. Clementine St., Oceanside, Calif.

TUBES—*Thyratron*

Aerolux Light Corp., 653 11th Ave., New York 19, N. Y.
Ⓥ Amperex Electronic Corp., 25 Washington St., Brooklyn 1, N. Y.
Bomac Laboratories, Beverly, Mass.
Ⓥ CHATHAM ELECTRONICS CORP., 475 Washington St., Newark 2, N. J. ADV. PG. 126.
Ⓥ Continental Electric Co., Geneva, Ill.
Ⓥ Du Mont Laboratories, Inc., Allen B., Instrument Div., 1000 Main Ave., Clifton, N. J.
Ⓥ Eitel-McCullough, Inc., San Bruno, Calif.
Ⓥ Electronic Enterprises, Inc., 65 7th Ave., Newark 4, N. J.
Electronic Products Co., 111 E. 3rd St., Mt. Vernon, N. Y.
Ⓥ ELECTRONS INC., 127 Sussex Ave., Newark 4, N. J. ADV. PG. 255.
Ⓥ FEDERAL TELEPHONE & RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.
Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Tube Div., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ GENERAL ELECTRONICS, INC., 101 Hazel St., Paterson, N. J. ADV. PG. 265.
Ⓥ Guardian Electronics Corp., 614 W. 51st St., New York 19, N. Y.
Ⓥ Kuthe Laboratories, Inc., 150 Summit St., Newark 4, N. J.
Ⓥ NATIONAL ELECTRONICS, INC., Geneva, Ill. ADV. PG. 100.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
Ⓥ RAYTHEON MFG. CO., Receiving & Special Tube Div., 55 Chapel St., Newton 58, Mass. ADV. PG. 257.
Ⓥ Standard Arcturus Corp., 54 Clark St., Newark 4, N. J.
Ⓥ Standard Telephone & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ SYLVANIA ELECTRIC PRODUCTS, INC., 1740 Broadway, New York 19, N. Y. ADV. PG. 286 to 290.
Ⓥ United Electronics Co., 42 Spring St., Newark 2, N. J.
Ⓥ WESTINGHOUSE ELECTRIC CORP., Electronic Tube Sales Dept., Bloomfield, N. J. ADV. PG. 78, 79.

TUBES—*Transmitting and Power*

Ⓥ Amperex Electronic Corp., 25 Washington St., Brooklyn, N. Y.
Ⓥ CHATHAM ELECTRONICS CORP., 475 Washington St., Newark 2, N. J. ADV. PG. 126.

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Ⓥ Cossor (Canada) Ltd., 301-303 Windsor St., Halifax, N. S., Canada.
Ⓥ Eitel-McCullough, Inc., San Bruno, Calif.
Ⓥ Electronic Enterprises, Inc., 65 7th Ave., Newark 4, N. J.
Electronic Products Co., 111 E. Third St., Mt. Vernon, N. Y.
Ⓥ FEDERAL TELEPHONE AND RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.
Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Tube Div., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ General Electronics, Inc., 101 Hazel St., Paterson, N. J.
Ⓥ Guardian Electronics Corp., 614 W. 51st St., New York 19, N. Y.
Ⓥ Heintz & Kaufman Div. of the Robert Dollar Co., 947 Broadway, Redwood City, Calif.
Ⓥ Hytron Radio & Electronics Corp., 76 Lafayette St., Salem, Mass.
Ⓥ Kothe Laboratories, Inc., 150 Summit St., Newark 4, N. J.
Ⓥ Lewis & Kaufman, Inc., P. O. Box 337, 90 El Rancho Ave., Los Gatos, Calif.
Ⓥ Litton Industries, San Carlos, Calif.
Ⓥ Machlett Laboratories, Springdale, Conn.
Ⓥ National Union Radio Corp., 350 Scotland Rd., Orange, N. J.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
Ⓥ Standard Arcturus Corp., 54 Clark St., Newark 4, N. J.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ SYLVANIA ELECTRIC PRODUCTS, INC., Emporium, Pa. ADV. PG. 286 to 290.
Ⓥ Taylor Tubes, Inc., 2312 Wabansia Ave., Chicago 47, Ill.
Ⓥ TUNG-SOL LAMP WORKS INC., 95 Eighth Ave., Newark 4, N. J. ADV. PG. 38.
Ⓥ United Electronics Co., 42 Spring St., Newark 2, N. J.
Ⓥ WESTINGHOUSE ELECTRIC CORP., Electronic Tube Sales Dept., Bloomfield, N. J. ADV. PG. 78, 79.

TUBES—*TR and Anti TR*

Bomac Laboratories, Beverly, Mass.
Ⓥ ECLIPSE-PIONEER DIV., Bendix Aviation Corp., Teterboro, N. J. ADV. PG. 176.
Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Tube Div., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ RAYTHEON MFG. CO., Power Tube Div., Waltham 54, Mass. ADV. PG. 257.
Ⓥ Standard Arcturus Corp., 54 Clark St., Newark 4, N. J.
Ⓥ SYLVANIA ELECTRIC PRODUCTS, INC., 1740 Broadway, New York 19, N. Y. ADV. PG. 286 to 290.
Ⓥ WESTINGHOUSE ELECTRIC CORP., Electronic Tube Sales Dept., Bloomfield, N. J. ADV. PG. 78, 79.

TUBES—*uhf*

Ⓥ ECLIPSE-PIONEER DIV., Bendix Aviation Corp., Teterboro, N. J. ADV. PG. 176.
Ⓥ Eitel-McCullough, Inc., San Bruno, Calif.
Ⓥ FEDERAL TELEPHONE & RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.
Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Tube Div., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Heintz & Kaufman Div. of the Robert Dollar Co., 947 Broadway, Redwood City, Calif.
Lewis & Kaufman, Inc., P. O. Box 337, 90 El Rancho Ave., Los Gatos, Calif.
Ⓥ Machlett Laboratories, Springdale, Conn.
Ⓥ National Union Radio Corp., 350 Scotland Rd., Orange, N. J.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
Ⓥ RAYTHEON MFG. CO., Receiving & Special Tube Div., 55 Chapel St., Newton 58, Mass. ADV. PG. 257.
Ⓥ Standard Arcturus Corp., 54 Clark St., Newark 4, N. J.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ SYLVANIA ELECTRIC PRODUCTS, INC., 1740 Broadway, New York 19, N. Y. ADV. PG. 286 to 290.
Ⓥ United Electronics Co., 42 Spring St., Newark 2, N. J.
Ⓥ WESTINGHOUSE ELECTRIC CORP., Electronic Tube Sales Dept., Bloomfield, N. J. ADV. PG. 78, 79.

TUBES—*Vacuum Thermocouple*

Ⓥ American Thermo Electric Co., 67 E. 8th St., New York 3, N. Y.
Ⓥ Amperex Electronic Corp., 25 Washington St., Brooklyn 1, N. Y.
BALLANTINE LABS., INC., Boonton, N. J. ADV. PG. 9c.
Ⓥ CHATHAM ELECTRONICS CORP., 475 Washington St., Newark 2, N. J. ADV. PG. 126.
Ⓥ Cossor (Canada) Ltd., 301-303 Windsor St., Halifax, N. S., Canada.
Ⓥ FEDERAL TELEPHONE & RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.
Ⓥ Guardian Electronics Corp., 614 W. 51st St., New York 19, N. Y.
Ⓥ Hastings Instrument Co., Box 1275, Hampton, Va.
Ⓥ Ideal-ite Mfg. Corp., Stirling, N. J.
Ⓥ National Research Corp., 70 Memorial Drive, Cambridge 42, Mass.
Ⓥ RAYTHEON MFG. CO., Receiving & Special Tube Div., 55 Chapel St., Newton 58, Mass. ADV. PG. 257.
Ⓥ Reeder & Co., Charles M., 171 Victor Ave., Detroit 3, Mich.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ SYLVANIA ELECTRIC PRODUCTS, INC., 1740 Broadway, New York 19, N. Y. ADV. PG. 286 to 290.

TUBES—*Voltage Regulating*

Aerolux Light Corp., 653 11th Ave., New York 19, N. Y.
Ⓥ Amperex Electronic Corp., 25 Washington St., Brooklyn 1, N. Y.
Ⓥ Anton Electronic Laboratories, Inc., 1226-1238 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ Cossor (Canada) Ltd., 301-303 Windsor St., Halifax, N. S., Canada.
Ⓥ ECLIPSE-PIONEER DIV., Bendix Aviation Corp., Teterboro, N. J. ADV. PG. 176.
Ⓥ Electronic Enterprises, Inc., 65 7th Ave., Newark 4, N. J.
Electronic Products Co., 111 E. 3rd St., Mt. Vernon, N. Y.
Ⓥ GENERAL ELECTRIC CO., Electronics Dept., Tube Div., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Guardian Electronics Corp., 614 W. 51st St., New York 19, N. Y.
Ⓥ Kothe Laboratories, Inc., 150 Summit St., Newark 4, N. J.
Ⓥ National Union Radio Corp., 350 Scotland Rd., Orange, N. J.
Ⓥ North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
Ⓥ RAYTHEON MFG. CO., Receiving & Special Tube Div., 55 Chapel St., Newton 58, Mass. ADV. PG. 257.
Ⓥ Standard Arcturus Corp., 54 Clark St., Newark 4, N. J.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ VICTOREEN INSTRUMENT CO., 5806 Hough Ave., Cleveland 3, Ohio. ADV. PG. 241.
Ⓥ WESTINGHOUSE ELECTRIC CORP., Electronic Tube Sales Dept., Bloomfield, N. J. ADV. PG. 78, 79.

TUBES—*X-Ray*

Ⓥ Amperex Electronic Corp., 25 Washington St., Brooklyn 1, N. Y.
Ⓥ Anton Electronic Laboratories, Inc., 1226-1238 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ Guardian Electronics Corp., 614 W. 51st St., New York 19, N. Y.
Ⓥ Machlett Laboratories, Springdale, Conn.
Ⓥ North American Philips Co., Inc., 100 East 42nd St., New York, N. Y.
Ⓥ Picker X-Ray Corp., 300 Fourth Ave., New York 10, N. Y.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ WESTINGHOUSE ELECTRIC CORP., Electronic Tube Sales Dept., Bloomfield, N. J. ADV. PG. 78, 79.

TUBING—*Aluminum Waveguide*

Ⓥ GENERAL PLATE DIVISION, Metals & Controls Corp., Attleboro, Mass. ADV. PG. 245.
Ⓥ Kaiser Aluminum & Chemical Sales, Inc., 1924 Broadway, Oakland 12, Calif.
Ⓥ SUPERIOR TUBE CO., 2504 Germantown Pike, Norristown, Pa. ADV. PG. 44, 45.
Ⓥ Uniform Tubes, Shurs Lane & Lansdale St., Roxborough, Philadelphia, Pa.

TUBING—*Brass or Copper*

Ⓥ Bridgeport Brass Co., 30 Grand St., Bridgeport, Conn.
Ⓥ Chase Brass & Copper Co., Inc., Waterbury 91, Conn.
Ⓥ Cinch Copper Tube & Products, Inc., Marlemont Ave., Marlemont, Cincinnati 27, Ohio.
Ⓥ JELLIFF MFG. CORP., S. O. 200, Pequot Ave., Southport, Conn. ADV. PG. 46.
Ⓥ Phelps Dodge Copper Products Corp., 40 Wall St., New York 5, N. Y.
Ⓥ Precision Tube Co., 3828 Terrace St., Philadelphia 28, Pa.
Ⓥ Production Engineering Co., 173 Sargeant Ave., Clifton, N. J.
Ⓥ Revere Copper & Brass Inc., 230 Park Ave., New York 17, N. Y.
Ⓥ Schutter, Carl W., Rockville Centre, N. Y.
Ⓥ Uniform Tubes, Shurs Lane & Lansdale St., Roxborough, Philadelphia, Pa.

TUBING—*Ceramic*

Ⓥ AMERICAN LAVA CORP., Chattanooga 5, Tenn. ADV. PG. 27.
Ⓥ Crowley & Co., Inc., Henry L., 1 Central Ave., West Orange, N. J.
Ⓥ Electrical Refractories Co., 50 Clark St., East Palestine, Ohio.
Ⓥ GENERAL CERAMICS & STEATITE CORP., Keasbey, N. J. ADV. PG. 219.
Ⓥ Ideal-ite Mfg. Corp., Stirling, N. J.
Ⓥ Kirchberger & Co., Inc., M., 1425 37th St., Brooklyn 18, N. Y.
Ⓥ Louthan Mfg. Co., East Liverpool, Ohio.
Ⓥ Locke Incorporated, P. O. Box 57, Baltimore 3, Md.
Ⓥ Mykroy, Inc., Arlington Heights Airport, Arlington Heights, Ill.
Ⓥ Norton Co., 1 New Bond St., Worcester 6, Mass.
Ⓥ STUPAKOFF CERAMIC & MFG. CO., Latrobe, Pa. ADV. PG. 147.
Ⓥ Thor Ceramics Inc., 225 Belleville Ave., Bloomfield, N. J.

TUBING—*Fabric*

Ⓥ Anchor Webbing Co., P. O. Box 1624, Providence, R. I.
Ⓥ BRAND & CO., WM., Willimantic, Conn. ADV. PG. 120, 121.
Ⓥ Dielectric Materials Co., 5315-17 N. Ravenswood Ave., Chicago 40, Ill.
Ⓥ Franklin Fibre-Lamitex Corp., 12th and French Sts., Wilmington, Delaware.
Ⓥ GENERAL ELECTRIC CO., Chemical Dept., Pittsfield, Mass. ADV. PG. 5 to 18.
Ⓥ Insulation Manufacturers Corp., 565 W. Washington Blvd., Chicago 6, Ill.
Ⓥ Mitchell-Rand Insulation Co., Inc., 51 Murray St., New York 7, N. Y. ADV. PG. 92.
Ⓥ National Varnished Products Corp., 211 Randolph Ave., Woodbridge, N. J. ADV. PG. 248.
Ⓥ VARFLEX CORP., 308 N. Jay St., Rome, N. Y. ADV. PG. 259.

TUBING—*Fibre*

Ⓥ Baer Co., N. S., 9 Montgomery St., Hillside, N. J.
brandywine Fibre Co., 15th & Poplar Sts., Wilmington, Del.
Ⓥ CLEVELAND CONTAINER CO., THE, 6201 Barberton Ave., Cleveland 2, Ohio. ADV. PG. 153.
Ⓥ Franklin Fibre-Lamitex Corp., 12th & French Sts., Wilmington, Del.
Ⓥ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
Ⓥ Keystone Electronics Co., 50-52 Franklin St., New York 13, N. Y.
Ⓥ Lamicoid Fabricators, Inc., 4545 W. Cortland St., Chicago 39, Ill.
Ⓥ MITCHELL-RAND INSULATION CO., INC., 51 Murray St., New York 7, N. Y. ADV. PG. 92.
Ⓥ National Gasket & Mfg. Co., Inc., 124 E. 25th St., New York 10, N. Y.
Ⓥ NATIONAL VULCANIZED FIBRE CO., Wilmington, Del. ADV. PG. 181.
Ⓥ PARAMOUNT PAPER TUBE CO., 614 Lafayette St., Fort Wayne, Ind. ADV. PG. 176.
Spaulding Fibre Co., Inc., 310 Wheeler St., Tonawanda, N. Y.
Ⓥ Taylor Fibre Co., Norristown, Pa.
Ⓥ VARFLEX CORP., 308 N. Jay St., Rome, N. Y. ADV. PG. 259.
Ⓥ Wilmington Fibre Specialty Co., P. O. Drawer 1028, Wilmington 99, Del.

TUBING—*Fused Quartz*

Ⓥ GENERAL ELECTRIC CO., Lamp Dept., Nela Park, Cleveland 12, Ohio. ADV. PG. 5 to 18.

TUBING—*Glass*

Ⓥ American Structural Products Co., Toledo 1, Ohio.
Ⓥ Bache & Co., Semon, 636 Greenwich St., New York, N. Y.
Ⓥ BRAND & CO., WM., Willimantic, Conn. ADV. PG. 120, 121.
brandywine Fibre Co., 15th & Poplar Sts., Wilmington, Del.
Ⓥ CORNING GLASS WORKS, Corning, N. Y. ADV. PG. 154.
Ⓥ GENERAL ELECTRIC CO., Lamp Dept., Nela Dept., Cleveland 12, Ohio. ADV. PG. 5 to 18.
Ⓥ MITCHELL-RAND INSULATION CO., INC., 51 Murray St., New York 7, N. Y. ADV. PG. 92.
Harshaw Scientific Div. of the Harshaw Chemical Co., 1945 E. 97th St., Cleveland 6, Ohio.

TUBING—*Glass Fibre Insulation*

Ⓥ BENTLEY-HARRIS MFG. CO., Conshohocken, Pa. ADV. PG. 112.
Ⓥ BRAND & CO., WM., Willimantic, Conn. ADV. PG. 120, 121.
Brandywine Fibre Co., 15th & Poplar Sts., Wilmington, Del.

(V) indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

(V)Continental Diamond Fibre Co., 16 Chapel St., Newark 16, Delaware.
(V)Dielectric Materials Co., 5315-17 N. Ravenswood Ave., Chicago 40, Ill.
(V)Insulation Manufacturers Corp., 565 W. Washington Blvd., Chicago 6, Ill.
(V)Keystone Electronics Co., 50-52 Franklin St., New York 13, N. Y.
(V)MITCHELL-RAND INSULATION CO., INC., 51 Murray St., New York 7, N. Y. ADV. PG. 92.
(V)National Electric Coil Co., Columbus 16, Ohio.
(V)NATIONAL VARNISHED PRODUCTS CORP., 211 Randolph Ave., Woodbridge, N. J. ADV. PG. 248.
(V)NATIONAL VULCANIZED FIBRE CO., Wilmington, Del. ADV. PG. 183.
(V)Taylor Fibre Co., Norristown, Pa.
(V)VARFLEX CORP., 308 N. Jay St., Rome, N. Y. ADV. PG. 259.

TUBING—*Knitted Wire*

(V)Metal Textile Corp., 647 E. First Ave., Roselle, N. J.

TUBING—*Metal and Alloy*

Bishop & Co., J., Platinum Works, Malvern, Pa.
(V)Bundy Tubing Co., 8109 E. Jefferson Ave., Detroit 14, Mich.
(V)Carpenter Steel Co., 142 West Bern St., Reading, Pa.
(V)Chase Brass & Copper Co., Inc., Waterbury 91, Conn.
(V)Division Lead Co., 816 W. Kinzie St., Chicago 22, Ill.
(V)Eastern Smelting & Refining Corp., 107-109 W. Brookline St., Boston 18, Mass.
(V)GENERAL PLATE DIVISION, Metals & Controls Corp., Attleboro, Mass. ADV. PG. 295.
(V)Haynes Stellite Division, Union Carbide & Carbon Corp., Kokomo, Indiana.
(V)International Nickel Co., Inc., 67 Wall St., New York 5, N. Y.
(V)Kaiser Aluminum & Chemical Sales, Inc., 1924 Broadway, Oakland 12, Calif.
(V)MAKEPEACE CO., D. E., Attleboro, Mass. ADV. PG. 97.
(V)National Lead Co., 111 Broadway, New York 6, N. Y.
(V)Precision Tube Co., 3828 Terrace St., Philadelphia 28, Pa.
(V)Production Engineering Co., 173 Sargeant Ave., Clifton, N. J.
(V)Revere Copper & Brass, Inc., 230 Park Avenue, New York 17, N. Y.
(V)Summerill Tubing Co., Div. Columbia Steel & Shafting Co., P. O. Box 1557, Pittsburgh 30, Pa.
(V)SUPERIOR TUBE CO., 2504 Germantown Pike, Norristown, Pa. ADV. PG. 44, 45.
Timken Roller Bearing Co., The, Canton, Ohio.
(V)Uniform Tubes, Shurs Lane & Larviston St., Roxborough, Philadelphia, Pa.

TUBING—*Mica*

(V)Continental Diamond Fibre Co., 16 Chapel St., Newark 16, Del.
(V)Insulation Manufacturers Corp., 565 W. Washington Blvd., Chicago 6, Ill.
(V)Keystone Electronics Co., 50-52 Franklin St., New York 13, N. Y.
(V)Macallen Co., The, 16 Macallen St., Boston 27, Mass.
(V)MICA INSULATOR CO., Schenectady 1, N. Y. ADV. PG. 232.
(V)MITCHELL-RAND INSULATION CO., INC., 51 Murray St., New York 7, N. Y. ADV. PG. 92.

TUBING—*Nickel*

Bishop & Co., J., Platinum Works, Malvern, Pa.
(V)Bundy Tubing Co., 8109 E. Jefferson Ave., Detroit 14, Mich.
(V)International Nickel Co., Inc., 67 Wall St., New York 5, N. Y.
(V)Precision Tube Co., 3828 Terrace St., Philadelphia 28, Pa.
(V)Production Engineering Co., 173 Sargeant Ave., Clifton, N. J.
(V)SUPERIOR TUBE CO., 2504 Germantown Pike, Norristown, Pa. ADV. PG. 44, 45.

TUBING—*Paper*

(V)ACCURATE PAPER TUBE CO., 651 N. Noble St., Chicago 22, Ill. ADV. PG. 268.
(V)CLEVELAND CONTAINER CO., THE, 6201 Barberton Ave., Cleveland 2, Ohio. ADV. PG. 153.
(V)Franklin Fibre-Lamitex Corp., 12th and French Sts., Wilmington, Del.
(V)GENERAL ELECTRIC CO., Chemical Dept., Pittsfield, Mass. ADV. PG. 5 to 18.
(V)PARAMOUNT PAPER TUBE CORP., 614 Lafayette St., Fort Wayne 4, Ind. ADV. PG. 176.
(V)PRECISION PAPER TUBE CO., 2033 W. Charleston St., Chicago 47, Ill. ADV. PG. 215.
Smith Mfg. Co., Nathan R., 105 Pasadena Ave., S. Pasadena, Calif.

TUBING—*Plastic*

(V)Anchor Plastics Co., Inc., 533-541 Canal St., New York 13, N. Y.
B & C Insulation Products, Inc., Lincoln Highway, Iselin, N. J.
(V)Baer Co., N. S., 9 Montgomery St., Hillside, N. J.
(V)BRAND & CO., WM., Willimantic, Conn. ADV. PG. 120, 121.
Brandywine Fibre Co., 15th & Poplar Sts., Wilmington, Del.
(V)Carol Cable Co., 190 Middle St., Pawtucket, R. I.
(V)CLEVELAND CONTAINER CO., THE, 6201 Barberton Ave., Cleveland 2, Ohio. ADV. PG. 153.
(V)Continental Diamond Fibre Co., 16 Chapel St., Newark 16, Del.
(V)Crane Packing Co., 1800 Cuyler Ave., Chicago 13, Ill.
(V)Dielectric Materials Co., 5315-17 N. Ravenswood Ave., Chicago 40, Ill.
(V)Formica Co., The, 4640 Spring Grove Ave., Cincinnati 32, Ohio.
(V)Franklin Fibre-Lamitex Corp., 12th & French Sts., Wilmington, Del.
(V)GENERAL ELECTRIC CO., Chemical Dept., Pittsfield, Mass. ADV. PG. 5 to 18.
Industrial Synthetics Corp., 225 North Ave., Garwood, N. J.
(V)Insulating Tube Co., 26 Cottage St., P. O. Box 1, Poughkeepsie, N. Y.
(V)Keystone Electronics Co., 50-52 Franklin St., New York 13, N. Y.
(V)Lamicoid Fabricators, Inc., 4545 W. Cortland St., Chicago 39, Ill.
(V)MICA INSULATOR CO., Schenectady 1, N. Y. ADV. PG. 232.
Micacraft Products Inc., 701 McCarter Highway, Newark 5, N. J.
(V)MITCHELL-RAND INSULATION CO., INC., 51 Murray St., New York 7, N. Y. ADV. PG. 92.
(V)NATIONAL VARNISHED PRODUCTS CORP., 211 Randolph Ave., Woodbridge, N. J. ADV. PG. 248.
(V)NATIONAL VULCANIZED FIBRE CO., Wilmington, Del. ADV. PG. 183.
(V)Plastyle Div., St. Regis Paper Co., 230 Park Ave., New York, N. Y.
(V)Parkwood Corp., Wakefield, Mass.
(V)Plasticraft Products Co., 20 Hudson St., New York 13, N. Y.
(V)Plax Corp., P. O. Box 1019, Hartford, Conn.
(V)PRECISION PAPER TUBE CO., 2033 W. Charleston St., Chicago 47, Ill. ADV. PG. 215.
(V)RICHARDSON CO., THE, 2767 Lake St., Melrose Park, Ill. ADV. PG. 144.
(V)Schott Co., Walter L., 9306 Santa Monica Blvd., Beverly Hills, California.
Spaulding Fibre Co., Inc., 310 Wheeler St., Tonawanda, N. Y.
(V)SURPRENANT MFG. CO., 199 Washington St., Boston 10, Mass. ADV. PG. 229.
(V)Synthane Corp., Oaks, Penna.
(V)Taylor Fibre Co., Norristown, Pa.
(V)U. S. Rubber Co., 1230 Avenue of the Americas, New York 20, N. Y.
(V)U. S. Stoneware Co., The, Akron 9, Ohio.
(V)VARFLEX CORP., 308 N. Jay St., Rome, N. Y. ADV. PG. 259.

TUBING—*Precious Metal*

(V)Baker & Co., Inc., 113 Astor St., Newark 5, N. J.
Bishop & Co., J., Platinum Works, Malvern, Pa.
(V)COHN CORP., SIGMUND, 44 Gold St., New York, N. Y. ADV. PG. 176.
(V)Eastern Smelting & Refining Corp., 107-109 W. Brookline St., Boston 18, Mass.
(V)GENERAL PLATE DIVISION, Metals & Controls Corp., Attleboro, Mass. ADV. PG. 295.
(V)MAKEPEACE CO., D. E., Attleboro, Mass. ADV. PG. 97.
(V)Uniform Tubes, Shurs Lane & Larviston St., Roxborough, Philadelphia, Pa.
(V)Wildberg Bros. Smelting & Refining Co., 742 Market St., San Francisco 2, Calif.

TUBING—*Steel*

(V)Armco Steel Corp., 703 Curtis St., Middletown, Ohio.
Bishop & Co., J., Platinum Works, Malvern, Pa.
(V)Bundy Tubing Co., 8109 E. Jefferson Ave., Detroit 14, Mich.
Carpenter Steel Co., Union, N. J.
(V)CRUCIBLE STEEL CO. OF AMERICA, 405 Lexington Ave., New York 17, N. Y. ADV. PG. 179.
(V)Production Engineering Co., 173 Sargeant Ave., Clifton, N. J.
(V)Republic Steel Corp., Republic Bldg., Cleveland 1, Ohio.
(V)Revere Copper & Brass Inc., 230 Park Avenue, New York 17, N. Y.
(V)Ryerson & Son, Inc., J. T., Box 8000-A, Chicago, Ill.
(V)Summerill Tubing Co., Div. Columbia Steel & Shafting Co., P. O. Box 1557, Pittsburgh 30, Pa.
(V)SUPERIOR TUBE CO., 2504 Germantown Pike, Norristown, Pa. ADV. PG. 44, 45.
Timken Roller Bearing Co., The, Canton, Ohio.
(V)Uniform Tubes, Shurs Lane & Larviston St., Roxborough, Philadelphia, Pa.

TUBING—*Synthetic Resin*

(V)BRAND & CO., WM., Willimantic, Conn. ADV. PG. 120, 121.
Brandywine Fibre Co., 15th & Poplar Sts., Wilmington, Del.
(V)CLEVELAND CONTAINER CO., THE, 6201 Barberton Ave., Cleveland 2, Ohio. ADV. PG. 153.
(V)Continental Diamond Fibre Co., 16 Chapel St., Newark 16, Del.
(V)Dielectric Materials Co., 5315-17 N. Ravenswood Ave., Chicago 40, Ill.
Industrial Synthetics Corp., 225 North Ave., Garwood, N. J.
(V)Insulating Tube Co., 26 Cottage St., P. O. Box 1, Poughkeepsie, N. Y.
(V)Lamicoid Fabricators, Inc., 4545 W. Cortland St., Chicago 39, Ill.
(V)MICA INSULATOR CO., Schenectady 1, N. Y. ADV. PG. 232.
(V)MITCHELL-RAND INSULATION CO., INC., 51 Murray St., New York 7, N. Y. ADV. PG. 92.
(V)Parkwood Corp., Wakefield, Mass.
Spaulding Fibre Co., Inc., 310 Wheeler St., Tonawanda, N. Y.
(V)SURPRENANT MFG. CO., 199 Washington St., Boston 10, Mass. ADV. PG. 229.
(V)Taylor Fibre Co., Norristown, Pa.
Western Felt Works, 4029 Ogden Ave., Chicago, Ill.
(V)WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

TUBING—*Varnished or Lacquered*

(V)Alpha Wire Corp., 50 Howard St., New York 13, N. Y.
(V)Anchor Webbing Co., P. O. Box 1624, Providence, R. I.
B & C Insulation Products, Inc., Lincoln Highway, Iselin, N. J.
(V)BENTLEY-HARRIS MFG. CO., Conshohocken, Pa. ADV. PG. 112.
(V)BRAND & CO., WM., Willimantic, Conn. ADV. PG. 120, 121.
(V)CLEVELAND CONTAINER CO., THE, 6201 Barberton Ave., Cleveland 2, Ohio. ADV. PG. 153.
(V)Dielectric Materials Co., 5315-17 N. Ravenswood Ave., Chicago 40, Ill.
(V)FEDERAL SCREW PRODUCTS INC., 224 W. Huron St., Chicago 10, Ill. ADV. PG. 271.
(V)GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
(V)GENERAL ELECTRIC CO., Chemical Dept., Pittsfield, Mass. ADV. PG. 5 to 18.
(V)Insulation Manufacturers Corp., 565 W. Washington Blvd., Chicago 6, Ill.
(V)MICA INSULATOR CO., Schenectady 1, N. Y. ADV. PG. 232.
(V)MITCHELL-RAND INSULATION CO., INC., 51 Murray St., New York 7, N. Y. ADV. PG. 92.
(V)National Electric Co., Columbus 16, Ohio.
(V)NATIONAL VARNISHED PRODUCTS CORP., 211 Randolph Ave., Woodbridge, N. J. ADV. PG. 248.
(V)Schott Co., Walter L., 9306 Santa Monica Blvd., Beverly Hills, Calif.
(V)VARFLEX CORP., 308 N. Jay St., Rome, N. Y. ADV. PG. 259.

TUBING—*Varnished Cambric Insulation*

(V)Alpha Wire Corp., 50 Howard St., New York 13, N. Y.
(V)Anchor Webbing Co., P. O. Box 1624, Providence, R. I.
(V)BENTLEY-HARRIS MFG. CO., Conshohocken, Pa. ADV. PG. 112.
(V)BRAND & CO., WM., Willimantic, Conn. ADV. PG. 120, 121.
(V)Dielectric Materials Co., 5315-17 N. Ravenswood Ave., Chicago 40, Ill.
(V)FEDERAL SCREW PRODUCTS, INC., 224 W. Huron St., Chicago 10, Ill. ADV. PG. 271.
(V)GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
(V)GENERAL ELECTRIC CO., Chemical Dept., Pittsfield, Mass. ADV. PG. 5 to 18.
(V)Insulation Manufacturers Corp., 565 W. Washington Blvd., Chicago 6, Ill.
(V)MICA INSULATOR CO., Schenectady 1, N. Y. ADV. PG. 232.
(V)MITCHELL-RAND INSULATION CO., INC., 51 Murray St., New York 7, N. Y. ADV. PG. 92.
(V)NATIONAL VARNISHED PRODUCTS CORP., 211 Randolph Ave., Woodbridge, N. J. ADV. PG. 248.
(V)VARFLEX CORP., 308 N. Jay St., Rome, N. Y. ADV. PG. 259.

TUNERS—*a-m*

Adaptol Co., 120 New Lots Ave., Brooklyn, N. Y.
(V)Aladdin Radio Industries, Inc., 501 W. 35th St., Chicago 16, Ill.
(V)Altec Lansing Corp., 161 Avenue of the Americas, New York 13, N. Y.
(V)BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
(V)Bogen Co., Inc., David, 663 Broadway, New York 12, N. Y.

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

Ⓥ Collins Audio Products Co., P. O. Box 368, Westfield, N. J.
Ⓥ Delco Radio Div., General Motors Corp., Kokomo, Ind.
Espey Mfg. Co., Inc., 528 E. 72nd St., New York, N. Y.
Ⓥ General Instrument Corp., 829 Newark Ave., Elizabeth 3, N. J.
Hartley Co., Inc., H. A., 152 Hammersmith Rd., London W. 6, England.
Kinsey Radio Mfg. Co., 5804 Oak St., Omaha 7, Neb.
Meissner Mfg. Div., Maguire Industries, Inc., Mt. Carmel, Ill.
Ⓥ Sargent Rayment Co., The, 212 Ninth St., Oakland 7, Calif.
Sickles Co., F. W., P. O. Box 330, Chicopee, Mass.
Smuckler & Co., Inc., A. F., 202 Tillary St., Brooklyn 1, N. Y.

TUNERS—*f-m*

Ⓥ Altec Lansing Corp., 161 Avenue of the Americas, New York 13, N. Y.
Ⓥ Atlas Coil Winders, Inc., Stamford, Conn.
Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ BROWNING LABORATORIES, INC., 750 Main St., Winchester, Mass. ADV. PG. 30.
Ⓥ Collins Audio Products Co., P. O. Box 368, Westfield, N. J.
Ⓥ DuMont Laboratories, Inc., Allen B., Television Receiver Div., Market St., East Paterson, N. J.
Ⓥ Fisher Radio Corp., 41 E. 47th St., New York, N. Y.
Ⓥ HEATH CO., Benton Harbor, Mich. ADV. PG. 229.
Kinsey Radio Mfg. Co., 5807 Oak St., Omaha 7, Neb.
Ⓥ Mallory & Co., Inc., P. R., 3029 E. Washington St., Indianapolis 6, Ind.
Meissner Mfg. Div., Maguire Industries, Inc., Mt. Carmel, Ill.
Monroe Coil Co., 2839 N. Narragansett Ave., Chicago 34, Ill.
Ⓥ Sargent Rayment Co., The, 212 Ninth St., Oakland 7, Calif.
Sickles Co., F. W., P. O. Box 330, Chicopee, Mass.
Smuckler & Co., Inc., A. F., 202 Tillary St., Brooklyn 1, N. Y.

TUNERS—*f-m/a-m*

Ⓥ Altec Lansing Corp., 161 Avenue of the Americas, New York 13, N. Y.
Ⓥ Bogen Co., Inc., David, 663 Broadway, New York 12, N. Y.
Ⓥ BROWNING LABORATORIES, INC., 750 Main St., Winchester, Mass. ADV. PG. 30.
Ⓥ Collins Audio Products Co., P. O. Box 368, Westfield, N. J.
Espey Mfg. Co., Inc., 528 E. 72nd St., New York, N. Y.
Ⓥ Fisher Radio Corp., 41 E. 47th St., New York, N. Y.
Meissner Mfg. Div., Maguire Industries, Inc., Mt. Carmel, Ill.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 75. Inside Back and Back Covers.
Ⓥ Radio Craftsmen, Inc., 1341 S. Michigan Ave., Chicago 5, Ill.
Ⓥ Sargent Rayment Co., The, 212 Ninth St., Oakland 7, Calif.
Ⓥ Scott Radio Labs., Inc., 4451 N. Ravenswood Ave., Chicago 40, Ill.
Sickles Co., F. W., P. O. Box 330, Chicopee, Mass.

TUNERS—*Klystron*

Ⓥ ELECTRONIC MEASUREMENTS CO., Red Bank, N. J. ADV. PG. 139.
Ⓥ MAKEPEACE CO., D. E., Attleboro, Mass. ADV. PG. 97.
Ⓥ POLYTECHNIC RESEARCH & DEVELOPMENT CO., INC., 202 Tillary St., Brooklyn 1, N. Y. ADV. PG. 56, 57.
Ⓥ SPERRY GYROSCOPE CO., Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.

TUNERS—*Microwave*

Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ ELECTRONIC MEASUREMENTS CO., Red Bank, N. J. ADV. PG. 139.
Ⓥ Microwave Equipment Co., Inc., North Caldwell, N. J.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Polarad Electronics Corp., 100 Metropolitan Ave., Brooklyn 11, N. Y.
Ⓥ POLYTECHNIC RESEARCH & DEVELOPMENT CO., INC., 202 Tillary St., Brooklyn 1, N. Y. ADV. PG. 56, 57.
Ⓥ Varian Associates, 99 Washington St., San Carlos, Calif.
Ⓥ Weymouth Instrument Co., 1440 Commercial St., East Weymouth 89, Mass.

TUNERS—*Permeability*

Ⓥ Aladdin Radio Industries, Inc., 501 W. 35th St., Chicago 16, Ill.
Ⓥ Atlas Coil Winders, Inc., Stamford, Conn.
Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ Collins Audio Products Co., P. O. Box 368, Westfield, N. J.
Ⓥ General Instrument Corp., 829 Newark Ave., Elizabeth 3, N. J.
Ⓥ Grigsby-Allison Co., Inc., 407 N. Salem Ave., Arlington Heights, Ill.
Meissner Mfg. Div., Maguire Industries, Inc., Mt. Carmel, Ill.
Ⓥ Mitchell Industries, Inc., Camp Wolters, Mineral Wells, Texas.
Monroe Coil Co., 2839 N. Narragansett Ave., Chicago 34, Ill.
Ⓥ Radio Condenser Co., Camden, N. J.
Sickles Co., F. W., P. O. Box 330, Chicopee, Mass.
Ⓥ STANDARD COIL PRODUCTS CO., 2329 N. Pulaski Rd., Chicago 39, Ill. ADV. PG. 233.
Ⓥ Teleradio Engineering Corp., 99 Wall St., New York 5, N. Y.

TUNERS—*Television*

Ⓥ Aladdin Radio Industries Inc., 501 W. 35th St., Chicago 16, Ill.
Ⓥ Automatic Mfg. Corp., 65 Gouverneur St., Newark 4, N. J.
Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
DX Radio Products Co., Inc., 2104 Armitage Ave., Chicago 47, Ill.
Ⓥ DuMont Laboratories, Inc., Allen B., Electronic Parts Div., Market St., East Paterson, N. J.
Electro Engineering & Mfg. Co., 627 W. Alexandrine, Detroit 1, Mich.
Ⓥ ELECTRONIC MEASUREMENTS CO., Red Bank, N. J. ADV. PG. 139.
Ⓥ Emerson Radio & Phonograph Corp., 111 8th Ave., New York, N. Y.
Ⓥ General Instrument Corp., 829 Newark Ave., Elizabeth 3, N. J.
Gothman Inc., Edwin T., 15 S. Throop St., Chicago, Ill.
Leonard Electric Products Co., Inc., 1562 61st St., Brooklyn, N. Y.
Ⓥ Mallory & Co., Inc., P. R., 3029 E. Washington St., Indianapolis 6, Ind.
Monroe Coil Co., 2839 N. Narragansett Ave., Chicago 34, Ill.
Ⓥ NATIONAL CO., INC., 61 Sherman St., Malden 48, Mass. ADV. PG. 33 to 36.
Ⓥ North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
Oak Mfg. Co., 1260 N. Clybourn Ave., Chicago 10, Ill.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Radio Condenser Co., Camden, N. J.
Ⓥ S. M. A. CO., 4721 N. Kedzie, Chicago, Ill. ADV. PG. 277.
Ⓥ Sarkes Tarzian Inc., 415 N. College Ave., Bloomington, Ind.
Ⓥ Scott Radio Labs., Inc., 4451 N. Ravenswood Ave., Chicago 40, Ill.
Sickles Co., F. W., P. O. Box 330, Chicopee, Mass.
Variable Condenser Corp., 65 Hope St., Brooklyn, N. Y.
Vokar Corp., 7300 Huron River Drive, Dexter, Mich.

TUNERS—*Television rf*

Ⓥ Aladdin Radio Industries Inc., 501 W. 35th St., Chicago 16, Ill.
Ⓥ Automatic Mfg. Corp., 65 Gouverneur St., Newark 4, N. J.
Ⓥ BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Ⓥ DuMont Laboratories, Inc., Allen B., Electronic Parts Div., Market St., East Paterson, N. J.
Electro Engineering & Mfg. Co., 627 W. Alexandrine, Detroit 1, Mich.
Ⓥ ELECTRONIC MEASUREMENTS CO., Red Bank, N. J. ADV. PG. 139.
Ⓥ General Instrument Corp., 829 Newark Ave., Elizabeth 3, N. J.
Gothman Inc., Edwin T., 15 S. Throop St., Chicago, Ill.
Leonard Electric Products Co., Inc., 1562 61st St., Brooklyn, N. Y.
Ⓥ Mallory & Co., Inc., P. R., 3029 E. Washington St., Indianapolis 6, Ind.
Meissner Mfg. Div., Maguire Industries, Inc., Mt. Carmel, Ill.
Ⓥ NATIONAL CO., INC., 61 Sherman St., Malden 48, Mass. ADV. PG. 33 to 36.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75. Inside Back and Back Covers.
Ⓥ S. M. A. CORP., 4721 N. Kedzie, Chicago, Ill. ADV. PG. 277.
Short Wave Plastic Forming Co., 2921 W. Almeda St., Burbank, Calif.
Sickles Co., F. W., P. O. Box 330, Chicopee, Mass.
Ⓥ STANDARD COIL PRODUCTS CO., 2329 N. Pulaski Rd., Chicago 39, Ill. ADV. PG. 233.

TUNERS—*uhf Ring*

Ⓥ Franklin Mfg. Corp., A. W., 43-20 34th St., Long Island City, N. Y.
Short Wave Plastic Forming Co., 2921 W. Almeda St., Burbank, Calif.
Woodwelding, Inc., 3000 W. Olive Ave., Burbank, Calif.

TUNING DEVICES—*Receiver Mechanical*

Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ Collins Audio Products Co., P. O. Box 368, Westfield, N. J.
Ⓥ Collins Radio Co., Cedar Rapids, Iowa.
Ⓥ Delco Radio Div., General Motors Corp., Kokomo, Ind.
Ⓥ Elliott Mfg. Co., 216 Prospect Ave., Binghamton, N. Y.
Ⓥ General Instrument Corp., 829 Newark Ave., Elizabeth 3, N. J.
Ⓥ Grigsby-Allison Co., Inc., 407 N. Salem Ave., Arlington Heights, Ill.
Ⓥ Kupfrian Mfg. Co., 350 State St., Binghamton, N. Y.
Ⓥ Manufacturers Thread Grinding Inc., P. O. Box 66, Eatontown, N. J.
Ⓥ NATIONAL CO., INC., 61 Sherman St., Malden 48, Mass. ADV. PG. 33 to 36.
Oak Mfg. Co., 1260 N. Clybourn Ave., Chicago 10, Ill.
Ⓥ Radio Condenser Co., Camden, N. J.
Ⓥ Teletronics Laboratory, Inc., 352 Maple Ave., Westbury, L. I., N. Y.

TUNING DEVICES—*Transmitter Mechanical*

Ⓥ Audograph Co., 1414 El Camino Real, San Carlos, Calif.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Ⓥ Collins Radio Co., Cedar Rapids, Iowa.
Ⓥ Elliott Mfg. Co., 216 Prospect Ave., Binghamton, N. Y.
Ⓥ Kupfrian Mfg. Co., 350 State St., Binghamton, N. Y.
Ⓥ Manufacturers Thread Grinding Inc., P. O. Box 66, Eatontown, N. J.
Ⓥ NATIONAL CO., INC., 61 Sherman St., Malden 48, Mass. ADV. PG. 33 to 36.
Ⓥ Press Wireless Mfg. Co., Inc., Cantiague Rd., Hicksville, L. I., N. Y.

TUNING DEVICES—*Turntable Units*

Meissner Mfg. Div., Maguire Industries, Inc., Mt. Carmel, Ill.

TURNTABLES—*Recording and Transcription*

Ⓥ Alliance Mfg. Co., Lake Park Blvd., Alliance, Ohio.
Ⓥ Bogen Co., Inc., David, 663 Broadway, New York 12, N. Y.
Ⓥ Canon Mfg. Co., 415 S. Aberdeen St., Chicago 7, Ill.
Ⓥ CINEMA ENGINEERING CO., 1510 W. Verdugo Ave., Burbank, Calif. ADV. PG. 186.
Ⓥ Fairchild Recording Equipment Corp., 154th St. & 7th Ave., Whitestone, N. Y.
Ⓥ Gates Radio Co., Quincy, Ill.
Ⓥ GRAY RESEARCH & DEVELOPMENT CO., 16 Arbor St., Hartford 1, Conn. ADV. PG. 239.
Ⓥ PRESTO RECORDING CORP., Paramus, N. J. ADV. PG. 94, 95.
Ⓥ Proctor Soundex Corp., 133 N. 6th Ave., Mt. Vernon, N. Y.
Ⓥ Q. R. K. Electronic Products, 445 N. Circle Drive, Fresno 4, Calif.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., General Offices, Camden, N. J. ADV. PG. 73 to 75. Inside, Back and Back Covers.
Radio Music Corp., Port Chester, N. Y.
Ⓥ Rek-O-Kut Co., Inc., 38-01 Queens Blvd., Long Island City, N. Y.

TWEETERS

See Loudspeakers

URANIUM

Ⓥ Mallinckrodt Chemical Works, Second & Mallinckrodt Sts., St. Louis 7, Mo.

ULTRASONIC EQUIPMENT

Refer to any of the following:
Crystals, Ultrasonic
Gages, Ultrasonic Thickness
Generators, Ultrasonic
Transducers, Ultrasonic

VACUUM GAGES

See Gages, Vacuum or Pirani

VACUUM INDICATING, RECORDING AND CONTROL EQUIPMENT

Ⓥ Bowser, Inc., Refrigeration Div., Terryville, Conn.
Ⓥ Clarke Instrument Corp., 910 King St., Silver Spring, Md.
Ⓥ Distillation Products Industries, Vacuum Equipment Div., 755 Ridge Rd. W., Rochester 3, N. Y.
Ⓥ Esterline-Angus Co., Inc., P. O. Box 596, Indianapolis, Ind.
Ⓥ FLADER, INC., FREDERIC, North Tonawanda, N. Y. ADV. PG. 240.

(V) indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

(V)Foxboro Co., The, Foxboro, Mass.
(V)Fredericks Co., Geo. E., Bethayres, Pa.
(V)Hastings Instrument Co., Box 1275, Hampton, Va.
(V)Litton Industries, San Carlos, Calif.
(V)Manning, Maxwell & Moore, Inc., Stratford, Conn.
(V)Manufacturers Engr. & Equip. Corp., Willow Grove, Pa.
(V)Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Roberts Aves., Philadelphia 44, Pa.
(V)National Research Corp., 70 Memorial Drive, Cambridge 42, Mass.
Process & Instruments, 60 Greenpoint Ave., Brooklyn 22, N. Y.
(V)Skaneateles Mfg. Co., Inc., 122 Dickerson St., Syracuse 2, N. Y.
(V)Stokes Machine Co., F. J., 5850 Tabor Rd., Olney P. O., Philadelphia 20, Pa.
(V)Vacuum Electronic Engineering Co., 316 37th St., Brooklyn 2, N. Y.
(V)Wallace & Tiernan Products, Inc., Belleville 9, N. J.
(V)**WESTON ELECTRICAL INSTRUMENT CORP.**, 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

VACUUM PUMPS—*High*

(V)Beach-Russ Co., 50 Church St., New York 7, N. Y.
(V)Central Scientific Co., 1700 Irving Park Road, Chicago 13, Ill.
(V)Clarendon Glass Blowing Co., 772 2nd St., Secaucus, N. J.
(V)Distillation Products Industries, Vacuum Equipment Div., 755 Ridge Rd. W., Rochester 3, N. Y.
(V)Elsier Engineering Co., Inc., 740 S. 13th St., Newark 3, N. J.
(V)Kitel-McCullough Inc., San Bruno, Calif.
(V)Fredericks Co., Geo. E., Bethayres, Pa.
Marshaw Scientific Div. of The Marshaw Chemical Co., 1945 E. 97th St., Cleveland 6, Ohio.
Maydu Bros., Plainfield, N. J.
(V)International Machine Works, 6904 Madison St., Guttenberg, N. J.
(V)**KOHLE ENGINEERING CO.**, 1307 Seventh St., North Bergen, N. J. ADV. PG. 180, 181.
(V)Kinney Mfg. Co., 3529 Washington St., Boston, Mass.
(V)Lear, Inc., 110 Ionia Ave., NW., Grand Rapids 2, Mich.
(V)Litton Industries, San Carlos, Calif.
(V)Manufacturers Engr. & Equip. Corp., Willow Grove, Pa.
(V)National Research Corp., 70 Memorial Drive, Cambridge 42, Mass.
Nelson Vacuum Pump Co., Geo. F., 2133 Fourth St., Berkeley 10, Calif.
(V)North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
(V)Optical Film Engineering Co., 2125 Cherry St., Philadelphia 3, Pa.
(V)Stokes Machine Co., F. J., 5850 Tabor Rd., Olney P. O., Philadelphia 20, Pa.
(V)Virtis Scientific Co., W. M., 1515 Sedgwick St., Chicago 10, Ill.

Vacuum Tube Voltmeter

See Voltmeters, Electronic

VACUUM UNITS

(V)Bowser, Inc., Refrigeration Div., Terryville, Conn.
(V)Central Scientific Co., 1700 Irving Park Rd., Chicago 13, Ill.
(V)Clarendon Glass Blowing Co., 772 2nd St., Secaucus, N. J.
(V)Distillation Product Industries, Vacuum Equipment Div., 755 Ridge Rd. W., Rochester 3, N. Y.
(V)Leiman Brothers, 114 Christie St., Newark 5, N. J.
(V)National Research Corp., 70 Memorial Drive, Cambridge 42, Mass.
Process & Instruments, 60 Greenpoint Ave., Brooklyn 22, N. Y.
(V)Skaneateles Mfg. Co., Inc., 122 Dickerson St., Syracuse 2, N. Y.
(V)Stokes Machine Co., F. J., 5850 Tabor Rd., Olney P. O., Philadelphia 20, Pa.

VALVES—*Solenoid*

Ace Precision Products Corp., 10777 Van Owen St., Burbank, Calif.
(V)Air Associates, Inc., Teterboro, N. J.
(V)Automatic Switch Co., 391 Lakeside Ave., Orange, N. J.
(V)Calrod Co., 1406 S. Hobart Blvd., Los Angeles 6, Calif.
(V)Connecticut Telephone & Electric Div., Great American Industries, Inc., 70 Britannia St., Meriden, Conn.
(V)Cutler-Hammer Inc., 411 N. 12th St., Milwaukee 1, Wis.
(V)Distillation Product Industries, Vacuum Equipment Div., 755 Ridge Rd. W., Rochester 3, N. Y.
(V)General Controls Co., Glendale 1, Calif.
(V)**GENERAL ELECTRIC CO.**, Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
(V)Gleason-Avery, Inc., Auburn, N. Y.
(V)Hydraulic Press Mfg. Co., Mt. Gilead, Ohio.
(V)Minneapolis-Honeywell Regulator Co., 2753 Fourth Ave. S., Minneapolis, Minn.
(V)Progressive Welder Co., 3050 E. Outer Drive, Detroit, Mich.
(V)Skinner Electric Valve Div., The Skinner Chuck Co., 40 Belden Ave., Norwalk, Conn.

VARISTORS

(V)**BRADLEY LABS., INC.**, 82 Meadow St., New Haven 10, Conn. ADV. PG. 152.
(V)**GENERAL ELECTRIC CO.**, Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
(V)**SYLVANIA ELECTRIC PRODUCTS, INC.**, 1740 Broadway, New York 19, N. Y. ADV. PG. 286 to 290.

VARNISH CAMBRIC COATINGS

Varnish, Insulating

See Insulating Compounds

VIBRATION ANALYSIS EQUIPMENT

(V)**AIRCRAFT ELECTRONICS ASSOCIATES, INC.**, 1031 New Britain Ave., Hartford 10, Conn. ADV. PG. 214.
(V)Caldyne Co., The, 751 Main St., Winchester, Mass.
(V)**CENTURY GEOPHYSICAL CORP.**, 1333 N. Utica, Tulsa 3, Okla. ADV. PG. 237.
(V)Commercial Research Labs., Inc., 20 Bartlett Ave., Detroit 3, Mich.
(V)Consolidated Engineering Corp., 620 N. Lake Ave., Pasadena 4, Calif.
(V)Cossor (Canada) Ltd., 301-303 Windsor St., Halifax, N. S., Canada.
(V)Electro Products Labs., Inc., 549 W. Randolph St., Chicago 6, Ill.
(V)**FLADER, INC., FREDERIC**, North Tonawanda, N. Y. ADV. PG. 240.
(V)**GENERAL RADIO CO.**, 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
(V)Hathaway Instrument Co., 1315 S. Clarkson St., Denver 10, Colo.
(V)**HEILAND RESEARCH CORP.**, 130 East 5th Avenue, Denver 9, Colo. ADV. PG. 242.
(V)**INDUSTRIAL ELECTRONICS, INC.**, 2457 Woodward Ave., Detroit 1, Mich. ADV. PG. 255.
(V)**KAY ELECTRIC CO.**, 14 Maple Ave., Pine Brook, N. J. ADV. PG. 193.
(V)**M B MFG. CO.**, 1060 State St., New Haven 11, Conn. ADV. PG. 253.
(V)Manufacturers Engr. & Equip. Corp., Willow Grove, Pa.
(V)Massa Laboratories, 3868 Carnegie St., Cleveland, Ohio.
(V)Miller Corp., Wm., 362 W. Colorado St., Pasadena, Calif.
(V)North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
(V)**PANORAMIC RADIO PRODUCTS, INC.**, 10 South Second Ave., Mt. Vernon, N. Y. ADV. PG. 270.
(V)Scott Inc., Herman Hosmer, 385 Putnam Ave., Cambridge 39, Mass.
(V)**SOUND APPARATUS CO.**, Stirling, N. J. ADV. PG. 24.
(V)**SPERRY GYROSCOPE CO.**, Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.
(V)**WESTINGHOUSE ELECTRIC CORP.**, P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

VIBRATION ANALYSIS EQUIPMENT—*Electronic Balancing*

(V)**CENTURY GEOPHYSICAL CORP.**, 1333 N. Utica, Tulsa 3, Okla. ADV. PG. 237.
(V)**GENERAL ELECTRIC CO.**, Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
(V)Gisholt Machine Co., 1245 E. Washington Ave., Madison 3, Wis.
(V)**KAY ELECTRIC CO.**, 14 Maple Ave., Pine Brook, N. J. ADV. PG. 193.
(V)**SPERRY GYROSCOPE CO.**, Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.
(V)**WESTINGHOUSE ELECTRIC CORP.**, P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

VIBRATION ANALYSIS EQUIPMENT—*High Temperature Fatigue*

(V)**M B MFG. CO.**, 1060 State St., New Haven 11, Conn. ADV. PG. 253.

VIBRATION ANALYSIS EQUIPMENT—*Vibration Fatigue*

(V)All American Tool & Mfg. Co., 1014 W. Fullerton St., Chicago 14, Ill.
(V)Baldwin Locomotive Works, Philadelphia 42, Pa.
(V)Caldyne Co., The, 751 Main St., Winchester, Mass.
(V)**CENTURY GEOPHYSICAL CORP.**, 1333 N. Utica, Tulsa 3, Okla. ADV. PG. 237.
(V)Dilles Co., The, Seymour, Conn.
(V)Electro Products Labs., 549 W. Randolph St., Chicago 6, Ill.
(V)**KAY ELECTRIC CO.**, 14 Maple Ave., Pine Brook, N. J. ADV. PG. 193.
(V)L. A. B. Corp., 31 Union Place, Summit, N. J.
(V)**M B MFG. CO.**, 1060 State St., New Haven 11, Conn. ADV. PG. 253.
(V)Thordarson Electric Mfg. Div., Maguire Industries, Inc., 500 W. Huron St., Chicago 10, Ill.
(V)**WESTINGHOUSE ELECTRIC CORP.**, P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

VIBRATORS

(V)Aerovox Corp., 740 Belleville Ave., New Bedford, Mass.
(V)**AIRPAX PRODUCTS CO.**, 1024 Greenmount Ave., Baltimore 2, Md. ADV. PG. 275.
(V)**AMERICAN TELEVISION & RADIO CO.**, 300 E. Fourth St., St. Paul 1, Minn. ADV. PG. 275.
(V)**CORNELL-DUBILIER ELECTRIC CORP.**, South Plainfield, N. J. ADV. PG. 70.
Eitron, Inc., 407 N. Jackson St., Jackson, Mich.
(V)James Vibrapower Co., 3224 W. Armitage Ave., Chicago 47, Ill.
(V)**KURMAN ELECTRIC CO., INC.**, 35-18 37th St., Long Island City 1, N. Y. ADV. PG. 214.
(V)**M B MFG. CO.**, 1060 State St., New Haven 11, Conn. ADV. PG. 253.
(V)Mallory & Co., Inc., P. R., 3029 E. Washington St., Indianapolis 6, Ind.
(V)Massa Laboratories, 3868 Carnegie St., Cleveland, Ohio.
Oak Mfg. Co., 1260 N. Clybourn Ave., Chicago 10, Ill.
(V)Phico Corp., Troga & C Sts., Philadelphia 34, Pa.
(V)Radiart Corp., The, 3571 W. 62nd St., Cleveland 2, Ohio.
(V)Servomechanisms, Inc., 142 Mineola Blvd., Mineola, N. Y.
(V)Stow Mfg. Co., 445 State St., Binghamton, N. Y.
Vokar Corp., 7300 Huron River Drive, Dexter, Mich.

VISCOSIMETERS WITH ELECTRONIC RECORDERS

(V)Crystal Research Labs., Inc., 29 Allyn St., Hartford, Conn.
(V)Manufacturers Engr. & Equip. Corp., Willow Grove, Pa.
(V)**RAYTHEON MFG. CO.**, Power Tube Div., Waltham 54, Mass. ADV. PG. 257.

VOLTAGE SUPPLIES—*Decade*

(V)Berkshire Laboratories, P. O. Box 70, Concord, Mass.
(V)**ELECTRONIC MEASUREMENTS CO.**, Red Bank, N. J. ADV. PG. 139.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.

VOLTMETERS—*Crystal*

(V)Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
(V)**GENERAL RADIO CO.**, 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Metropolitan Electronics & Instruments Co., 106 Fifth Ave., New York 11, N. Y.

VOLTMETERS

(V)Assembly Products, Inc., Chagrin Falls 6, Ohio.
(V)Associated Research, Inc., 3758 W. Belmont, Chicago 18, Ill.
(V)Beede Electrical Instrument Co., Inc., Penacook, N. H.
(V)Burlington Instrument Co., Burlington, Iowa.
Coastwise Electronics Co., Inc., 130 N. Beaudry Ave., Los Angeles, Calif.
(V)Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
(V)**DEJUR-AMSCO CORP.**, Northern Blvd. at 45th St., Long Island City 1, N. Y. ADV. PG. 267.
(V)Dittmer & Co., Inc., W. C., 5410 W. Harrison St., Chicago 44, Ill.
(V)Electric Design & Mfg. Corp., Burlington, Iowa.
Electro-Mechanical Instrument Co., 812 Chestnut St., Perkasie, Pa.
(V)**ELECTRONIC INSTRUMENT CO., INC.**, 276 Newport St., Brooklyn 12, N. Y. ADV. PG. 274.
(V)**ELECTRONIC MEASUREMENTS CO.**, Red Bank, N. J. ADV. PG. 139.
(V)Empire-Angus Co., Inc., P. O. Box 596, Indianapolis 6, Ind.
(V)**GENERAL ELECTRIC CO.**, Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
(V)**GENERAL RADIO CO.**, 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Harshaw Scientific Div. of The Harshaw Chemical Co., 1945 E. 97th St., Cleveland 6, Ohio.
(V)**HEWLETT-PACKARD CO.**, 395 Page Mill Rd., Palo Alto, Calif. ADV. PG. 68, 69.
(V)**HICKOK ELECTRICAL INSTRUMENT CO.**, 10514 Dupont Ave., Cleveland, Ohio. ADV. PG. 215.
(V)Industrial Devices, Inc., 22 State Rd., Edgewater, N. J.
(V)International Instruments, Inc., 331 East St., New Haven 11, Conn.

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

Ⓥ JBT INSTRUMENTS, INC., 441 Chapel St., New Haven 8, Conn. ADV. PG. 241.
Ⓥ MARION ELECTRICAL INSTRUMENT CO., Manchester, N. H. ADV. PG. 139.
Ⓥ Meters, Inc., 915 Westfield Blvd., Indianapolis 20, Ind.
Metropolitan Electronics & Instruments Co., 106 Fifth Ave., New York 11, N. Y.
Norton Electrical Instrument Co., 59 Hilliard St., Manchester, Conn.
Ⓥ Oak Ridge Products Mfg. Div. of Video Television, Inc., 239 E. 127th St., New York 35, N. Y.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Ⓥ Precision Electronics, 641 Milwaukee Ave., Chicago 22, Ill.
Ⓥ Pyramid Instrument Corp., 49 Howard St., New York, N. Y.
Ⓥ Reliance Instrument Co., 3027 W. Van Buren St., Chicago 12, Ill.
Ⓥ Roller-Smith, Bethlehem, Pa.
Ⓥ Sensitive Research Instrument Corporation, 9 Elm Avenue, Mount Vernon, N. Y.
Ⓥ SHURITE METERS, 61 Hamilton St., New Haven 6, Conn. ADV. PG. 216.
Ⓥ Simpson Electric Co., Div. of American Gage & Machine Co., 5208 W. Kinzie St., Chicago 44, Ill.
Ⓥ Sterling Mfg. Co., 9205 Detroit Ave., Cleveland, Ohio.
Ⓥ SYLVANIA ELECTRIC PRODUCTS, INC., Emporium, Pa. ADV. PG. 286 to 290.
Ⓥ Transvision Inc., 460 North Ave., New Rochelle, N. Y.
Ⓥ Triplett Electrical Instrument Co., 286 Harmon Rd., Bluffton, Ohio.
Ⓥ Welch Scientific Co., W. M., 1515 Sedgwick St., Chicago 10, Ill.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

VOLTMETERS—*Electronic*

American British Technology, Inc., 57 Park Ave., New York 16, N. Y.
Ⓥ Audio Instrument Co., 1947 Broadway, New York 23, N. Y.
Ⓥ BALLANTINE LABORATORIES, INC., Boonton, N. J. ADV. PG. 96.
Ⓥ Barber Labs., Alfred W., 32-44 Francis Lewis Blvd., Flushing, N. Y.
Ⓥ BETA ELECTRIC CORP., 1762 Third Ave., New York 29, N. Y. ADV. PG. 171.
Ⓥ C. G. S. LABORATORIES, INC., 36 Ludlow St., Stamford, Conn. ADV. PG. 244.
Coastwise Electronics Co., Inc., 130 N. Beverly Ave., Los Angeles, Calif.
Ⓥ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ Daven Co., 191 Central Ave., Newark 4, N. J.
Ⓥ ELECTRONIC DESIGNS, INC., Irvington, N. Y. ADV. PG. 199.
Ⓥ ELECTRONIC INSTRUMENT CO., INC., 276 Newport St., Brooklyn 12, N. Y. ADV. PG. 274.
Ⓥ ELECTRONIC MEASUREMENTS CO., Red Bank, N. J. ADV. PG. 139.
Ⓥ Feiler Engineering Co., 1601 S. Federal St., Chicago 16, Ill.
Ⓥ Fluke Engineering Co., John, Box 755, Springdale, Conn.
Ⓥ FREED TRANSFORMER CO., INC., 1736 Weirfield Ave., Brooklyn 27, N. Y. ADV. PG. 143.
Ⓥ Furst Electronics, 10A S. Jefferson St., Chicago 6, Ill.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ GENERAL RADIO CO., 275 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 48, 49.
Ⓥ HEATH CO., Benton Harbor, Mich. ADV. PG. 279.
Ⓥ HEWLETT-PACKARD CO., 395 Page Mill Rd., Palo Alto, Calif. ADV. PG. 68, 69.
Ⓥ HICKOK ELECTRICAL INSTRUMEINT CO., 10514 Dupont Ave., Cleveland, Ohio. ADV. PG. 215.
Ⓥ Industrial Control Co., 1462 Undercliff Ave., New York 59, N. Y.
Ⓥ INSTRUMENT ELECTRONICS, 42-17A Douglaston Blvd., Douglaston, L. I., N. Y. ADV. PG. 240.
Ⓥ Jackson Electrical Instrument Co., 16 S. Patterson Blvd., Dayton 1, Ohio.
Ⓥ KAY ELECTRIC CO., 14 Maple Ave., Pine Brook, N. J. ADV. PG. 193.
Ⓥ KROHN-HITE INSTRUMENT CO., 580 Massachusetts Ave., Cambridge 39, Mass. ADV. PG. 108.
McMurdo Silver Co., Inc., 1240 Main St., Hartford 3, Conn.
Ⓥ Marconi Instruments, Ltd., 23 Beaver St., New York 4, N. Y.
Ⓥ MEASUREMENTS CORP., Boonton, N. J. ADV. PG. 145.
Metropolitan Electronics & Instruments Co., 106 Fifth Ave., New York 11, N. Y.
Ⓥ MILLIVAC INSTRUMENTS, Box 3027, New Haven, Conn. ADV. PG. 192.
Ⓥ North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Precision Apparatus Co., Inc., 92-27 Horace Harding Blvd., Elmhurst, N. Y.
Ⓥ Radio City Products Co., Inc., 152 W. 25th St., New York 1, N. Y.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
Ⓥ Rauland Electronics Co., 152 W. 25th St., New York, N. Y.
Ⓥ Roller-Smith, Bethlehem, Pa.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Sierra Electronic Corp., San Carlos, Calif.
Ⓥ Simpson Electric Co., Div. of American Gage & Machine Co., 5208 W. Kinzie St., Chicago 44, Ill.
Ⓥ Southwestern Industrial Electronics Co., 2631 Post Oak Rd., Houston 19, Texas.
Ⓥ Supreme, Inc., Greenwood, Miss.
Ⓥ SYLVANIA ELECTRIC PRODUCTS, INC., Emporium, Pa. ADV. PG. 286 to 290.
Ⓥ Varo Mfg. Co., Inc., Box 438, Garland, Texas.
Western Electro-Acoustics Labs., 621 Spring St., Los Angeles 14, Calif.
Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.
Ⓥ Wheelco Instruments Co., 847 W. Harrison St., Chicago 7, Ill.

VOLTMETERS—*Electrostatic*

Ⓥ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ FERRANTI ELECTRIC, INC., 30 Rockefeller Plaza, New York 20, N. Y. ADV. PG. 81.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Sensitive Research Instrument Corporation, 9 Elm Ave., Mt. Vernon, N. Y.

VOLTAGE REGULATORS & STABILIZERS

See Regulators, Voltage Regulators & Stabilizers

VOLT-OHM-MILLIAMMETERS

Ⓥ Beede Electrical Instrument Co., Inc., Penacook, N. H.
Coastwise Electronics Co., Inc., 130 N. Beverly Ave., Los Angeles, Calif.
Ⓥ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Douglas Radio Labs., 40 Wayland St., Boston 25, Mass.
Ⓥ ELECTRONIC DESIGNS, INC., Irvington, N. Y. ADV. PG. 199.
Ⓥ ELECTRONIC INSTRUMENT CO., INC., 276 Newport St., Brooklyn 12, N. Y. ADV. PG. 274.
Ⓥ Feiler Engineering Co., 1601 S. Federal St., Chicago 16, Ill.
Ⓥ GENERAL ELECTRIC CO., Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ HEATH CO., Benton Harbor, Mich. ADV. PG. 279.
Ⓥ HICKOK ELECTRICAL INSTRUMENT CO., 10514 Dupont Ave., Cleveland, Ohio. ADV. PG. 215.
Ⓥ Instrument Laboratories, 315 W. Walton Place, Chicago 10, Ill.
Ⓥ International Instruments, Inc., 331 East St., New Haven 11, Conn.
Ⓥ Jackson Electrical Instrument Co., 16 S. Patterson Blvd., Dayton 1, Ohio.
McMurdo Silver Co., 1240 Main St., Hartford 3, Conn.
Ⓥ MARION ELECTRICAL INSTRUMENT CO., Manchester, N. H. ADV. PG. 139.
Ⓥ Meters, Inc., 915 Westfield Blvd., Indianapolis 20, Ind.
Metropolitan Electronics & Instruments Co., 106 Fifth Ave., New York 11, N. Y.
Ⓥ MILLIVAC INSTRUMENTS, Box 3027, New Haven, Conn. ADV. PG. 192.
Ⓥ North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Precision Apparatus Co., Inc., 92-27 Horace Harding Blvd., Elmhurst, N. Y.
Ⓥ Radio City Products Co., Inc., 152 W. 25th St., New York 1, N. Y.
Ⓥ RADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
Radio Design Co., 1353 Sterling Place, Brooklyn, N. Y.
Ⓥ Rauland Electronics Co., 152 W. 25th St., New York, N. Y.
Ⓥ Simpson Electric Co., Div. of American Gage & Machine Co., 5208 W. Kinzie St., Chicago 44, Ill.
Ⓥ Star Measurements Co., 442 East 146th St., New York 54, N. Y.
Ⓥ Sterling Mfg. Co., 9205 Detroit Ave., Cleveland 2, Ohio.
Ⓥ Superior Instruments Co., 227 Fulton St., New York 7, N. Y.
Supreme, Inc., Greenwood, Miss.
Ⓥ SYLVANIA ELECTRIC PRODUCTS, INC., Emporium, Pa. ADV. PG. 286 to 290.
Ⓥ Triplett Electrical Instrument Co., 286 Harmon Rd., Bluffton, Ohio.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Ⓥ WESTON ELECTRICAL INSTRUMENT CORP., 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

WASHERS—*Insulating*

Ⓥ AEROLITE ELECTRONIC HARDWARE CORP., 507 26th St., Union City, N. J. ADV. PG. 138.
Ⓥ ATLANTIC INDIA RUBBER WORKS, INC., 571 W. Polk St., Chicago 7, Ill. ADV. PG. 271.
Ⓥ Baer Co., N. S., 9 Montgomery St., Hillside, N. J.
Beach Precision Parts Co., Boonton, N. J.
Ⓥ BIWAX CORP., 3445 Howard St., Skokie, Ill. ADV. PG. 242.
Brandywaine Fibre Co., 15th & Poplar Sts., Wilmington, Del.
Ⓥ Continental Diamond Fibre Co., 16 Chapel St., Newark 16, Del.
Electronic Mechanics, Inc., 70 Clifton Blvd., Clifton, N. J.
Ⓥ FEDERAL SCREW PRODUCTS INC., 224 W. Huron St., Chicago 10, Ill. ADV. PG. 271.
Felsenthal & Sons, Inc., G., 4100 W. Grand Ave., Chicago 51, Ill.
Ⓥ Franklin Fibre-Lamitex Corp., 12th & French Sts., Wilmington, Del.
Ⓥ Franklin Mfg. Corp., A. W., 43-20 34th St., Long Island City, N. Y.
Ⓥ GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill. ADV. PG. 213.
Ⓥ GENERAL CERAMICS & STEATITE CORP., Keasbey, N. J. ADV. PG. 219.
Ⓥ Hallett Mfg. Co., 1601 Florence Ave., Inglewood, Calif.
Ⓥ Industrial Precision Products Co., 315-325 N. Hoyne Ave., Chicago 12, Ill.
Insulating Fabricators, Inc., 150 Union Ave., East Rutherford, N. J.
Ⓥ Insulation Manufacturers Corp., 565 W. Washington Blvd., Chicago 6, Ill.
Ⓥ INSULINE CORP. OF AMERICA, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
Ⓥ Isolantite Mfg. Corp., Stirling, N. J.
Ⓥ Keystone Electronics Co., 50-52 Franklin St., New York 13, N. Y.
Ⓥ Kirchheimer & Co., Inc., M., 1425 37th St., Brooklyn 18, N. Y.
Ⓥ Lasonia Corp., 37 S. 6th St., Newark 7, N. J.
LeMayna Mfg. Co., Inc., East Rutherford, N. J.
Ⓥ Lamicoid Fabricators, Inc., 4545 W. Cortland St., Chicago 39, Illinois.
Ⓥ Mica Mfg. Co., East Liverpool, Ohio.
Mica Fabricating Co., 53 Central Ave., Rochelle Park, N. J.
Ⓥ MICA INSULATOR CO., Schenectady 1, N. Y. ADV. PG. 232.
Ⓥ Micacraft Products Inc., 701 McCarter Highway, Newark 5, N. J.
Ⓥ Moore Co., Howard J., 108 Park Row, New York 7, N. Y.
Ⓥ MYCALEX CORP. OF AMERICA, 60 Clifton Blvd., Clifton, N. J. ADV. PG. 163.
Ⓥ Mykroy, Inc., Arlington Heights Airport, Arlington Heights, Ill.
Ⓥ National Gasket & Washer Mfg. Co., 124 E. 25th St., New York 10, N. Y.
Ⓥ NATIONAL VULCANIZED FIBRE CO., Wilmington, Del. ADV. PG. 183.
Ⓥ Parisian Novelty Co., 3510 South Western Ave., Chicago 9, Ill.
Penn Fibre & Specialty Co., 2020 E. Westmoreland St., Philadelphia 34, Pa.
Plastic Accessories, Inc., 93 Mercer St., New York 12, N. Y.
Ⓥ Plax Corp., P. O. Box 1019, Hartford, Conn.
Prestole Inc., 95 Mercer St., New York, N. Y.
Quadrus Mfg. Co., 218 W. Grand Ave., Chicago 11, Ill.
Ⓥ RICHARDSON CO., The, 2767 Lake St., Melrose Park, Ill. ADV. PG. 244.
Ⓥ Rogers Corp., Manchester, Connecticut.
Ⓥ Schott Co., Walter L., 930c Santa Monica Blvd., Beverly Hills, Calif.
Ⓥ Smith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.
Spaulding Fibre Co., Inc., 310 Wheeler St., Tonawanda, N. Y.
Ⓥ Steward Mfg. Co., D. M., Chattanooga, Tenn.
Ⓥ Stimpson Screw Products Inc., 216-222 W. Hubbard St., Chicago 10, Ill.
Ⓥ STUPAKOFF CERAMIC & MFG. CO., Latrobe, Pa. ADV. PG. 147.
Ⓥ Taylor Fibre Co., Norristown, Pa.
Ⓥ Thor Ceramics Inc., 225 Belleville Ave., Bloomfield, N. J.
Ⓥ Waterbury Companies, Inc., Waterbury 90, Conn.
Ⓥ Wilmington Fibre Specialty Co., P. O. Drawer 1008, Wilmington 99, Del.
Ⓥ Wright Washer Mfg. Co., 2264 S. Bay St., Milwaukee 7, Wis.

WASHERS—*Lock*

Aiken Stamping Co., 1923 Nebraska Ave., Toledo 7, Ohio.
Ⓥ Allmetal Screw Products Co., Inc., 33 Greene St., New York 13, N. Y.
Ⓥ American Nut & Bolt Fastener Co., 2045 Doerr St., Pittsburgh 12, Pa.
Ⓥ Autoscrew Co., 216-222 W. 18th St., New York, N. Y.
Chase Brass & Copper Co., Inc., Waterbury 91, Conn.
Ⓥ FEDERAL SCREW PRODUCTS INC., 224 W. Huron St., Chicago 10, Ill. ADV. PG. 271.

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

Ⓥ Garrett Co., Inc., G. K., D & Tioga Sts., Phila. 34, Pa.
Ⓥ **GENERAL CEMENT MFG. CO.**, 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
Ⓥ Harper Co., H. M., 8200 Lehigh Ave., Morton Grove, Ill.
Ⓥ Lamson & Sessions Co., 1971 W. 85th St., Cleveland, Ohio.
Ⓥ Locke Incorporated, P. O. Box 57, Baltimore 3, Md.
Ⓥ National Lock Washer Co., 40 Hermon St., Newark 5, N. J.
Penn Fibre & Specialty Co., 2020 E. Westmoreland St., Philadelphia 34, Pa.
Ⓥ Penn-Union Electric Corp., 315 State Street, Erie, Pa.
Ⓥ Philadelphia Steel & Wire Corp., Penn St. & Belfield Avenue, Philadelphia, Pa.
Ⓥ Positive Lock Washer Co., 181 Miller St., Newark, N. J.
Ⓥ Ryerson & Son, Inc., J. T., Box 8000-A, Chicago, Ill.
Ⓥ Schott Co., Walter L., 9306 Santa Monica Blvd., Beverly Hills, Calif.
Ⓥ Shakeproof Inc., Div. of Illinois Tool Wks., 2501 N. Keeler Ave., Chicago 39, Ill.
Ⓥ Smith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.
Ⓥ Standard Locknut & Lockwasher, Inc., 510 N. Capitol Ave., Indianapolis, Ind.
Ⓥ Stronghold Screw Products, Inc., 216-222 West Hubbard St., Chicago 10, Ill.
Ⓥ United Screw & Bolt Corp., 2513 W. Cullerton St., Chicago 8, Ill.
Ⓥ Waldes Kohinoor Inc., 47-16 Austel Place, Long Island City 1, N. Y.
Ⓥ Wrought Washer Mfg. Co., 2264 S. Bay St., Milwaukee 7, Wis.

WASHERS—*Metal*

Ⓥ **AEROLITE ELECTRONIC HARDWARE CORP.**, 507-2615 St., Union City, N. J. ADV. PG. 138.
Ⓥ Almetal Screw Products Co., Inc., 33 Greene St., New York 13, N. Y.
Ⓥ American Nut & Bolt Fastener Co., 2045 Doerr St., Pittsburgh 12, Pa.
Ⓥ **ART-LLOYD METAL PRODUCTS CORP.**, 2973 Cropsey Ave., Brooklyn 14, N. Y. ADV. PG. 272.
Ⓥ Atlas Tack Corp., Pleasant St., Fairhaven, Mass.
Ⓥ Autoscrew Co., 216-222 W. 18th St., New York, N. Y.
Ⓥ Baer Co., N. S., 9 Montgomery St., Hillside, N. J.
Ⓥ Bound Brook Oil-Less Bearing Co., Bound Brook, N. J.
Ⓥ Chase Brass & Copper Co., Inc., Waterbury 91, Conn.
Ⓥ Citation Products Co., 233 E. 146th St., New York 51, N. Y.
Ⓥ Division Lead Co., 836 W. Kinzie St., Chicago 22, Ill.
Ⓥ **FEDERAL SCREW PRODUCTS INC.**, 224 W. Huron St., Chicago 10, Ill. ADV. PG. 271.
Ⓥ Felt Products Mfg. Co., 1504 W. Carroll Ave., Chicago 7, Ill.
Ⓥ Franklin Mfg. Corp., A. W., 43-20 34th St., Long Island City, N. Y.
Ⓥ Garrett Co., Inc., G. K., D & Tioga Sts., Phila. 34, Pa.
Ⓥ **GENERAL CEMENT MFG. CO.**, 919 Taylor Ave., Rockford, Ill. ADV. PG. 273.
Ⓥ Greene Mfg. Corp., G. G., Warren, Pa.
Ⓥ Harper Co., H. M., 8200 Lehigh Ave., Morton Grove, Ill.
Ⓥ **HEYMAN MFG. CO.**, 300 Michigan Ave., Kenilworth, N. J. ADV. PG. 26.
Ⓥ Hubbard Spring Co., M. D., Central Ave., Pontiac, Mich.
Ⓥ Industrial Precision Products Co., 315-325 N. Hoyne Ave., Chicago 12, Ill.
Ⓥ **INSULINE CORP. OF AMERICA**, 36-02 35th Ave., Long Island City, N. Y. ADV. PG. 246, 247.
Ⓥ International Powder Metallurgy Co., 439 W. Main St., Ridgway, Pa.
La Magna Mfg. Co., Inc., East Rutherford, N. J.
Ⓥ Lamson & Sessions Co., 1971 W. 85th St., Cleveland, Ohio.
Ⓥ Locke Incorporated, P. O. Box 57, Baltimore 3, Md.
Ⓥ National Gasket & Washer Mfg. Co., 124 E. 25th St., New York 10, N. Y.
Penn Fibre & Specialty Co., 2020 E. Westmoreland St., Phila. 34, Pa.
Ⓥ Pheoll Mfg. Co., 5700 Roosevelt Rd., Chicago 50, Ill.
Quadriga Mfg. Co., 213 W. Grand Ave., Chicago 11, Ill.
Ⓥ Ryerson & Son, Inc., J. T., Box 8000-A, Chicago, Ill.
Ⓥ Schott Co., Walter L., 9306 Santa Monica Blvd., Beverly Hills, Calif.
Ⓥ Scovill Mfg. Co., Industrial Fastener Div., Waterbury, Conn.
Ⓥ Smith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.
Ⓥ Stanley Works, The, New Britain, Conn.
Ⓥ Stimson Co., Inc., Edwin B., 74 Franklin Ave., Brooklyn 5, N. Y.
Ⓥ Stronghold Screw Products, Inc., 216-222 West Hubbard St., Chicago 10, Ill.
Ⓥ United Screw & Bolt Co., 2513 W. Cullerton St., Chicago 8, Ill.
Ⓥ Whitehead Stamping Co., 1691 W. Lafayette Blvd., Detroit 16, Mich.
Ⓥ Wrought Washer Mfg. Co., 2264 S. Bay St., Milwaukee 7, Wis.
York Materials Co., Inc., P. O. Box 510, Jamaica, N. Y.

WATTMETERS

Ⓥ Associated Research, Inc., 3758 W. Belmont, Chicago 18, Ill.
Ⓥ **BIRD ELECTRONIC CORP.**, 1800 E. 38th St., Cleveland 14, Ohio. ADV. PG. 184, 185.
Ⓥ Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Ⓥ Esterline-Angus Co., Inc., P. O. Box 596, Indianapolis 6, Ind.
Fluke Engineering Co., John, Box 755, Springdale, Conn.
Ⓥ **GENERAL ELECTRIC CO.**, Apparatus Dept., Schenectady 5, N. Y. ADV. PG. 5 to 18.
Ⓥ Hathaway Instrument Co., 1315 S. Clarkson St., Denver 10, Colo.
Ⓥ **HICKOK ELECTRICAL INSTRUMENT CO.**, 10514 Dupont Ave., Cleveland, Ohio. ADV. PG. 215.
Ⓥ **JONES ELECTRONICS CO., M. C.**, Bristol, Conn. ADV. PG. 138.
Ⓥ Marconi Instruments, Ltd., 23 Beaver St., New York 4, N. Y.
Metropolitan Electronics & Instruments Co., 106 Fifth Ave., New York 11, N. Y.
Norton Electrical Instrument Co., 89 Hilliard St., Manchester, Conn.
Ⓥ **RAWSON ELECTRICAL INSTRUMENT CO.**, 111 Potter St., Cambridge 42, Mass. ADV. PG. 156.
Ⓥ Reliance Instrument Co., 3027 W. Van Buren St., Chicago 12, Ill.
Ⓥ Sensitive Research Instrument Corporation, 9 Elm Ave., Mt. Vernon, N. Y.
Ⓥ Simpson Electric Co., Div. of American Gage & Machine Co., 5208 W. Kinzie St., Chicago 44, Ill.
Ⓥ **SPERRY GYROSCOPE CO.**, Div. of The Sperry Corp., Great Neck, N. Y. ADV. PG. 85, 86.
Ⓥ Triplett Electrical Instrument Co., 286 Harmon Road, Bluffton, Ohio.
Ⓥ Weich Scientific Co., W. M., 1515 Sedgwick St., Chicago 10, Ill.
Ⓥ **WESTINGHOUSE ELECTRIC CORP.**, P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.
Ⓥ **WESTON ELECTRICAL INSTRUMENT CORP.**, 614 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 108.

WAVEGUIDES—*Combination Rigid & Flexible*

Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Crystal Research Labs., Inc., 29 Allyn St., Hartford, Conn.
Ⓥ **KAY ELECTRIC CO.**, 14 Maple Ave., Pine Brook, N. J. ADV. PG. 193.
Ⓥ Kings Electronics Co., Inc., 811 Lexington Ave., Brooklyn 21, N. Y.
Ⓥ Microwave Equipment Co., Inc., North Caldwell, N. J.
Ⓥ Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Product Development Co., Inc., Arlington, N. J.
Ⓥ **RAYTHEON MFG. CO.**, Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
Ⓥ Schutter, Carl W., Rockville Centre, N. Y.
Selectar Industries, Inc., 401 E. 138th St., New York 54, N. Y.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ Technicraft Laboratories, Inc., Thomaston-Waterbury Rd., Thomaston, Conn.
Terpening Co., L. H., 16 W. 61st St., New York, N. Y.

WAVEGUIDES—*Flexible*

Ⓥ **AIRTRON, INC.**, 101 E. Elizabeth Ave., Linden, N. J. ADV. PG. 46.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Crystal Research Labs., Inc., 29 Allyn St., Hartford, Conn.
Product Development Co., Inc., Arlington, N. J.
Ⓥ **RAYTHEON MFG. CO.**, Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
Selectar Industries, Inc., 401 E. 138th St., New York 54, N. Y.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ Technicraft Laboratories, Inc., Thomaston-Waterbury Rd., Thomaston, Conn.
Terpening Co., L. H., 16 W. 61st St., New York, N. Y.
Ⓥ **TITEFLEX, INC.**, 500 Frelinghuysen Ave., Newark 5, N. J. ADV. PG. 148.

WAVEGUIDES—*Rigid*

Ⓥ **AIRTRON, INC.**, 101 E. Elizabeth Ave., Linden, N. J. ADV. PG. 46.
Bunnell & Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Crystal Research Labs., Inc., 29 Allyn St., Hartford, Conn.
Ⓥ **KAY ELECTRIC CO.**, 14 Maple Ave., Pine Brook, N. J. ADV. PG. 193.
Ⓥ Kent Co., F. C., 64-72 Howard St., Irvington, N. J.
Ⓥ Kings Electronics Co., Inc., 811 Lexington Ave., Brooklyn 21, N. Y.
Ⓥ **MAKEPEACE CO., D. E.**, Attleboro, Mass. ADV. PG. 97.
Ⓥ Microwave Equipment Co., Inc., North Caldwell, N. J.
Ⓥ Product Development Co., Inc., Arlington, N. J.
Ⓥ Schutter, Carl W., Rockville Centre, N. Y.
Selectar Industries, Inc., 401 E. 138th St., New York 54, N. Y.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Ⓥ Technicraft Laboratories, Inc., Thomaston-Waterbury Rd., Thomaston, Conn.
Terpening Co., L. H., 16 W. 61st St., New York, N. Y.
Ⓥ **TITEFLEX, INC.**, 500 Frelinghuysen Ave., Newark 5, N. J.
Ⓥ Varian Associates, 99 Washington St., San Carlos, Calif.

WAX IMPREGNATING

Ⓥ Alyco Products Co., Inc., 26 Court St., Brooklyn, N. Y.
Ⓥ Haliwax Products Division, Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y.
Ⓥ Stevenson Bro. & Co., 110 Race St., Philadelphia 6, Pa.
Ⓥ **ZOPHAR MILLS, INC.**, 112-130 26th St., Brooklyn 32, N. Y. ADV. PG. 192.

WAXES

See Insulating Compounds

WEDGES—*Wood Slot*

Ⓥ **MITCHELL-RAND INSULATION CO., INC.**, 51 Murray St., New York 7, N. Y. ADV. PG. 92.

WELDERS—*Electronic Controlled*

Ⓥ Kaiser Engineering Co., Inc., 740 S. 13th St., Newark 3, N. J.
Eutectic Welding Alloys Corp., 40 Worth St., New York 13, N. Y.
Ⓥ **KAHLE ENGINEERING CO.**, 1307 7th St., North Bergen, N. J. ADV. PG. 180, 181.
Ⓥ Progressive Welder Co., 3050 E. Outer Dr., Detroit, Mich.
Ⓥ **RAYTHEON MFG. CO.**, Equipment Sales Div., Waltham 54, Mass. ADV. PG. 257.
Ⓥ Sciaky Bros., Inc., 4915 W. 67th St., Chicago 38, Ill.
Ⓥ Vangtronic Corp., The, 237 John St., Bridgeport 3, Conn.

WINDING MACHINES, COIL

See Coil Winding Machines

WIRE *Aluminum*

Ⓥ Aluminum Co. of America, Gulf Bldg., Pittsburgh, Pa.
Birnbach Radio Co., Inc., 145 Hudson St., New York, N. Y.
Ⓥ Flexo Wire Co., Inc., 70 W. First St., Oswego, N. Y.
Ⓥ General Cable Corp., 420 Lexington Ave., New York 30, N. Y.
Ⓥ House of Television Inc., 40 W. 4th St., New York 12, N. Y.
Ⓥ **J F M MFG. CO.**, 6101-23 Sixteenth Ave., Brooklyn, N. Y. ADV. PG. 254, 264.
House of Television Inc., 40 W. 4th St., New York 12, N. Y.
Ⓥ Kaiser Aluminum & Chemical Sales, Inc., 1924 Broadway, Oakland 12, Calif.
Ⓥ Little Falls Alloys, Inc., 190 Caldwell Ave., Paterson 1, N. J.
Ⓥ North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
Ⓥ Reynolds Metals Co., Market Research Dept., 19 E. 47th St., New York 17, N. Y.
Ⓥ Uniform Tubes, Shurs Lane & Larviston St., Roxborough, Philadelphia, Pa.

WIRE—*Annunciator*

Ⓥ Alpha Wire Corp., 50 Howard St., New York, N. Y.
Ⓥ American Steel & Wire Co., U. S. Steel Corp. Subs., Rockefeller Bldg., Cleveland 13, Ohio.
Ⓥ Anaconda Wire & Cable Co., 25 Broadway, New York 4, N. Y.
Ⓥ Belden Mfg. Co., 4647 W. Van Buren St., Chicago 44, Ill.
Birnbach Radio Co., Inc., 145 Hudson St., New York, N. Y.
Ⓥ Columbia Wire & Supply Co., 2850 Irving Park Rd., Chicago 18, Ill.
Ⓥ Connecticut Telephone & Electric Div., Great American Industries, Inc., 70 Britannia St., Meriden, Conn.
Ⓥ Consolidated Wire & Associated Companies, 1635 S. Clinton St., Chicago 16, Ill.
Ⓥ **CORNISH WIRE CO.**, 15 Park Row, N. York 7, N. Y. ADV. PG. 140.
Ⓥ Diamond Wire & Cable Co., Sycamore, Ill.
Ⓥ Federal Wire & Cable Corp., Haverstraw, N. Y.
Ⓥ General Cable Corp., 420 Lexington Ave., New York 17, N. Y.
Goldmark Wire Co., James, The, 75 Murray St., New York 7, N. Y.
Ⓥ Plastoid Corp., 10 Mill Rd., Hamburg, N. J.
Ⓥ Roebling's Sons Co., John A., 640 Broad St., Trenton 2, N. J.
Ⓥ U. S. Rubber Co., 1230 Avenue of the Americas, New York 20, N. Y.

Indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

WIRE—*Antenna*

AEROLITE ELECTRONIC HARDWARE CORP., 507 26th St., Union City, N. J. ADV. PG. 136.
Alpha Wire Corp., 50 Howard St., New York, N. Y.
American Electric Cable Co., 181 Appleton St., Holyoke, Mass.
AMERICAN PHENOLIC CORPORATION, 1830 S. 54th Ave., Chicago 50, Ill. ADV. PG. 191.
Anaconda Wire & Cable Co., 25 Broadway, New York 4, N. Y.
Belden Mfg. Co., 4647 W. Van Buren St., Chicago 44, Ill.
Birnbach Radio Co., Inc., 145 Hudson St., New York, N. Y.
BOSTON INSULATED WIRE & CABLE CO., 63 Bay St., Boston 25, Mass. ADV. PG. 157.
Brach Mfg. Co., 200 Central Ave., Newark 4, N. J. 121.
BRAND & CO., WM., Willimantic, Conn. ADV. PG. 120, 121.
Columbia Wire & Supply Co., 2850 Irving Park Rd., Chicago 18, Ill.
Consolidated Wire & Associated Companies, 1635 S. Clinton St., Chicago 16, Ill.
Copperweld Steel Co., Glassport, Pa.
CORNISH WIRE CO., 15 Park Row, New York 7, N. Y. ADV. PG. 140.
Connor (Canada) Ltd., 301-303 Windsor St., Halifax, N. S., Canada.
Diamond Wire & Cable Co., Sycamore, Ill.
Electronics Co., Inc., 60 Franklin St., East Orange, N. J.
Essex Wire Corp., 1601 Wall St., Fort Wayne 6, Ind.
FEDERAL TELEPHONE AND RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.
Federal Wire & Cable Corp., Haverstraw, N. Y.
FLADER, INC., FREDERIC, North Tonawanda, N. Y. ADV. PG. 240.
Flexo Wire Co., Inc., 70 W. First St., Oswego, N. Y.
General Cable Corp., 420 Lexington Ave., New York 17, N. Y.
HUDSON WIRE CO., Winsted Div., Winsted, Conn. ADV. PG. 168.
J. F. D. MFG. CO., 4101-23 Sixteenth Ave., Brooklyn, N. Y. ADV. PG. 254, 264.
Jones, Howard T., Wyanet, Mass.
PHALO PLASTICS CORP., 25 Foster St., Worcester 8, Mass. ADV. PG. 212.
Phelps Dodge Copper Products Corp., 40 Wall St., New York 5, N. Y.
Plastic Wire & Cable Corp., Jewett City, Conn.
Riebling's Sons Co., John A., 640 Broad St., Trenton 2, N. J.
TECHNICAL APPLIANCE CORP., Sherbourne, N. Y. ADV. PG. 201.
Vincent Co., H. A., The, 105 Chestnut St., Newark 5, N. J.

WIRE—*Asbestos Insulated*

American Electric Cable Co., 181 Appleton St., Holyoke, Mass.
American Steel & Wire Co., U. S. Steel Corp. Subs., Rockefeller Bldg., Cleveland 13, Ohio.
Belden Mfg. Co., 4647 W. Van Buren St., Chicago 44, Ill.
BOSTON INSULATED WIRE & CABLE CO., 63 Bay St., Boston 25, Mass. ADV. PG. 157.
Columbia Wire & Supply Co., 2850 Irving Park Rd., Chicago 18, Ill.
Driver Insulated Wire Co., 249 Roosevelt Ave., Pawtucket, R. I.
Consolidated Wire & Associated Companies, 1635 S. Clinton St., Chicago 16, Ill.
Essex (Canada) Ltd., 301-303 Windsor St., Halifax, N. S., Canada.
Diamond Wire & Cable Co., Sycamore, Ill.
Essex Wire Corp., 1601 Wall St., Fort Wayne 6, Ind.
General Cable Corp., 420 Lexington Ave., New York 17, N. Y.
GENERAL ELECTRIC CO., Construction Materials Dept., 1285 Boston Ave., Bridgeport, Conn. ADV. PG. 5 to 18.
Hewitt Co., Canal St., Passaic, N. J.
Phelps Dodge Copper Products Corp., 40 Wall St., New York 5, N. Y.
Riebling's Sons Co., John A., 640 Broad St., Trenton 2, N. J.
Rockbestos Products Corp., 308 Nicoll St., New Haven 4, Conn.
ROME CABLE CORP., 330 Ridge St., Rome, N. Y.
Simplex Wire & Cable Co., 79 Sidney St., Cambridge 39, Mass.
Stephan Co., Arthur, Bridgeport, Conn.
Standard Telephones & Cables, Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Sun Copper & Wire Co., 132 Beckwith Ave., Paterson, N. J.
Universal Textiled Wire Co., 2421 E. 30th St., Los Angeles, Calif.

WIRE—*Ceramic Insulated*

Consolidated Wire & Associated Companies, 1635 S. Clinton St., Chicago 16, Ill.
Harrison Electric Co., North Adams, Mass.

WIRE—*Copper*

Alma Wire Co., New Haven 14, Conn.
Alpha Wire Corp., 50 Howard St., New York, N. Y.
American Electric Cable Co., 181 Appleton St., Holyoke, Mass.
American Steel & Wire Co., U. S. Steel Corp. Subs., Rockefeller Bldg., Cleveland 13, Ohio.
Anaconda Wire & Cable Co., 25 Broadway, New York 4, N. Y.
Belden Mfg. Co., 4647 W. Van Buren St., Chicago 44, Ill.
BOSTON INSULATED WIRE & CABLE CO., 63 Bay St., Boston 25, Mass. ADV. PG. 157.
Carol Cable Co., 140 Middle St., Pawtucket, R. I.
Chase Brass & Copper Co., Inc., Waterbury 91, Conn.
Cillyer Insulated Wire Works, Inc., 69 Gordon Ave., Providence 5, R. I.
Columbia Wire & Supply Co., 2850 Irving Park Rd., Chicago 18, Ill.
Consolidated Wire & Associated Companies, 1635 S. Clinton St., Chicago 16, Ill.
CORNISH WIRE CO., 15 Park Row, New York 7, N. Y. ADV. PG. 140.
Diamond Wire & Cable Co., Sycamore, Ill.
Dielectric Materials Co., 5315-17 N. Rosenwald Ave., Chicago 40, Ill.
ELECTRO-WIRE SERVICE, 9 Beekman St., New York 7, N. Y. ADV. PG. 249.
Essex Wire Corp., 1601 Wall St., Fort Wayne 6, Ind.
Federal Wire & Cable Corp., Haverstraw, N. Y.
FLADER, INC., FREDERIC, North Tonawanda, N. Y. ADV. PG. 240.
General Cable Corp., 420 Lexington Ave., New York 17, N. Y.
GENERAL ELECTRIC CO., Construction Materials Dept., 1285 Boston Ave., Bridgeport, Conn. ADV. PG. 5 to 18.
General Insulated Wire Works, Inc., 69 Gordon Ave., Providence 5, R. I.
Goldmark Wire Co., Inc., 75 Murray St., New York 7, N. Y.
Guilmark Inc., Edwin T., 10 S. Throop St., Chicago, Ill.
Hazard Insulated Wire Works Div., The, Okonite Co., Wilkes-Barre, Pa.
HUDSON WIRE CO., Winsted Div., Winsted, Conn. ADV. PG. 168.
Kellogg Switchboard & Supply Co., 6650 S. Cicero Ave., Chicago 38, Ill.
LENZ ELECTRIC MFG. CO., 1751 North Western Ave., Chicago 47, Ill. ADV. PG. 122.
Meissner Mfg. Div., Maguire Industries, Inc., Mt. Carmel, Ill.
New England Electrical Works, Inc., Lisbon, N. H.
Okonite Co., Canal St., Passaic, N. J.
Phelps Dodge Copper Products Corp., 40 Wall St., New York 5, N. Y.
Plastic Wire & Cable Corp., Jewett City, Conn.
Plastoid Corp., 10 Mill Rd., Hamburg, N. J.
Rea Magnetic Wire Co., E. Pontiac St., Fort Wayne, Ind.
Rockbestos Products Corp., 308 Nicoll St., New Haven 4, Conn.
Riebling's Sons Co., John A., 640 Broad St., Trenton 2, N. J.
ROME CABLE CORP., 330 Ridge St., Rome, N. Y. ADV. PG. 133.
Simplex Wire & Cable Co., 79 Sidney St., Cambridge 39, Mass.
Stephan Co., Arthur, Bridgeport, Conn.
Standard Telephones & Cables, Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Sun Copper & Wire Co., 132 Beckwith Ave., Paterson, N. J.
SURPRENANT MFG. CO., 199 Washington St., Boston 20, Mass. ADV. PG. 229.
Tensolite Corp., The, 7 Hudson St., N. Tarrytown, N. Y.
U. S. Rubber Co., 1230 Avenue of the Americas, New York 20, N. Y.
Western Insulated Wire Co., 2421 E. 30th St., Los Angeles, Calif.
Whitaker Cable Corp., Kansas City 16, Mo.
Whitney Blake Co., New Haven, Conn.

WIRE—*Cut and Stripped*

Cycle Electronic Laboratories, 14 Northfield Ave., West Orange, N. J.
ELECTRO-WIRE SERVICE, 9 Beekman St., New York 7, N. Y. ADV. PG. 249.
Jamaica Wire Co., 145-03 Jamaica Ave., Jamaica, L. I., N. Y.
Merold Specialty Products, 68 E. 131st St., New York, N. Y.
Smith Mfg. Co., Nathan R., 105 Pasadena Ave., S. Pasadena, Calif.

WIRE—*Enameled*

Alma Wire Co., New Haven 14, Conn.
Alpha Wire Corp., 50 Howard St., New York, N. Y.
American Steel & Wire Co., U. S. Steel Corp. Subs., Rockefeller Bldg., Cleveland 13, Ohio.
Anaconda Wire & Cable Co., 25 Broadway, New York 4, N. Y.
Belden Mfg. Co., 4647 W. Van Buren St., Chicago 44, Ill.
Birnbach Radio Co., Inc., 145 Hudson St., New York, N. Y.
Chase Brass & Copper Co., Inc., Waterbury 91, Conn.
Consolidated Wire & Associated Companies, 1635 S. Clinton St., Chicago 16, Ill.
DRIVER-HARRIS CO., 201 Middlesex St., Harrison, N. J. ADV. PG. 117.
Essex Wire Corp., 1601 Wall St., Fort Wayne 6, Ind.
General Cable Corp., 420 Lexington Ave., New York 17, N. Y.
GENERAL ELECTRIC CO., Construction Materials Dept., 1285 Boston Ave., Bridgeport 2, Conn. ADV. PG. 5 to 18.
Goldmark Wire Co., James, 75 Murray St., New York 7, N. Y.
HUDSON WIRE CO., Winsted Div., Winsted, Conn. ADV. PG. 168.
Industrial Equipment Co., Gettysburg, Pa.
Lewis Engineering Co., 52 Rubber Ave., Naugatuck, Conn.
Phelps Dodge Copper Products Corp., 40 Wall St., New York 5, N. Y.
Rea Magnet Wire Co., E. Pontiac St., Fort Wayne, Ind.
Riebling's Sons Co., John A., 640 Broad St., Trenton 2, N. J.
Stephan Co., Arthur, Bridgeport, Conn.
Sun Copper & Wire Co., 132 Beckwith Ave., Paterson, N. J.
Wheeler Insulated Wire Co., Inc., 150 E. Aurora St., Waterbury 91, Conn.

WIRE—*Fine Wire Specialties*

Alma Wire Co., New Haven 14, Conn.
Alloy Metal Wire Co., 13th & Penna. Ave., Prospect Park, Pa.
Alpha Wire Corp., 50 Howard St., New York, N. Y.
American Electric Cable Co., 181 Appleton St., Holyoke, Mass.
ART WIRE & STAMPING CO., 227 High St., Newark 2, N. J. ADV. PG. 169.
BOSTON INSULATED WIRE & CABLE CO., 63 Bay St., Boston 25, Mass. ADV. PG. 157.
COHN CORP., SIGMUND, 44 Gold St., New York, N. Y. ADV. PG. 176.
Consolidated Wire & Associated Companies, 1635 S. Clinton St., Chicago 16, Ill.

(V)DRIVER CO., WILBUR B., 150 Riverside Ave., Newark 4, N. J. ADV. PG. 123.
(V)DRIVER-HARRIS CO., 201 Middlesex St., Harrison, N. J. ADV. PG. 117.
(V)Eastern Smelting & Refining Corp., 107-109 W. Brookline St., Boston 18, Mass.
(V)GENERAL PLATE DIVISION, METALS & CONTROLS CORP., Attleboro, Mass. ADV. PG. 245.
Goldmark Wire Co., James, 75 Murray St., New York 7, N. Y.
(V)Grammes & Sons, Inc., L. F., 389 Union St., Allentown 2, Pa.
(V)HUDSON WIRE CO., Winsted Div., Winsted, Conn. ADV. PG. 168.
(V)Little Falls Alloys, Inc., 190 Caldwell Ave., Paterson 1, N. J.
Messner Mfg. Div., Maguire Industries, Inc., Mt. Carmel, Ill.
(V)New England Electrical Works, Inc., Lisbon, N. H.
(V)NEY CO., J. M., 179 Elm St., Hartford, Conn. ADV. PG. 142.
(V)North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
(V)Phelps Dodge Copper Products Corp., 40 Wall St., New York 5, N. Y.
Secon Metals Corp., 228 E. 45th St., New York 17, N. Y.
(V)SYLVANIA ELECTRIC PRODUCTS, INC., Emporium, Pa. ADV. PG. 286 at 290.
(V)Wickwire Spencer Steel Div., The, Colorado Fuel and Iron Corp., The, 500 Fifth Avenue, New York 18, N. Y.
(V)Wilson Co., H. A., The, 105 Chestnut St., Newark 5, N. J.

WIRE—*Glass Insulated*

(V)Acme Wire Co., New Haven 14, Conn.
(V)ALDEN PRODUCTS CO., 117 No. Main St., Brockton 64, Mass. ADV. PG. 235.
(V)Alpha Wire Corp., 50 Howard St., New York, N. Y.
(V)American Electric Cable Co., 181 Appleton St., Holyoke, Mass.
(V)American Steel & Wire Co., U. S. Steel Corp. Subs., Rockefeller Bldg., Cleveland 13, Ohio.
(V)Anaconda Wire & Cable Co., 25 Broadway, New York 4, N. Y.
(V)BOSTON INSULATED WIRE & CABLE CO., 61 Hay St., Boston 25, Mass. ADV. PG. 157.
(V)BRAND & CO., WM., Willimantic, Conn. ADV. PG. 120, 121.
(V)Carol Cable Co., 140 Middle St., Pawtucket, R. I.
(V)Chase Brass & Copper Co., Inc., Waterbury 91, Conn.
(V)Columbia Wire & Supply Co., 2850 Irving Park Rd., Chicago 18, Ill.
(V)Consolidated Wire & Associated Companies, 1635 S. Clinton St., Chicago 16, Ill.
(V)Cosser (Canada) Ltd., 301-303 Windsor St., Halifax, N. S., Canada.
(V)Dielectric Materials Co., 5315-17 N. Ravenswood Ave., Chicago 40, Ill.
(V)DRIVER-HARRIS CO., 201 Middlesex St., Harrison, N. J. ADV. PG. 117.
(V)Essex Wire Corp., 1601 Wall St., Fort Wayne 6, Ind.
(V)General Cable Corp., 420 Lexington Ave., New York 17, N. Y.
(V)GENERAL ELECTRIC CO., Construction Materials Dept., 1285 Boston Ave., Bridgeport, Conn. ADV. PG. 5 to 18.
(V)HUDSON WIRE CO., Winsted Div., Winsted, Conn. ADV. PG. 168.
Inductive Equipment Co., Gettysburg, Pa.
(V)LENZ ELECTRIC MFG. CO., 1751 North Western Ave., Chicago 47, Ill. ADV. PG. 122.
(V)Par-Metal Products Corp., Paterson 1, N. J.
(V)PHALO PLASTICS CORP., 25 Foster St., Worcester 8, Mass. ADV. PG. 212.
(V)Phelps Dodge Copper Products Corp., 40 Wall St., New York 5, N. Y.
(V)Plastoid Corp., 10 Mill Rd., Hamburg, N. J.
(V)Product Development Co., Inc., Arlington, N. J.
(V)Rockbestos Products Corp., 308 Nicoll St., New Haven 4, Conn.
(V)Roebling's Sons Co., John A., 640 Broad St., Trenton 2, N. J.
(V)ROME CABLE CORP., 330 Ridge St., Rome, N. Y. ADV. PG. 131.
Sun Copper & Wire Co., 132 Beckwith Ave., Paterson 1, N. J.
(V)SURPRENANT MFG. CO., 199 Washington St., Boston 10, Mass. ADV. PG. 229.
(V)VARFLEX CORP., 308 N. Joy St., Rome, N. Y. ADV. PG. 259.

WIRE—*Guy*

(V)Alpha Wire Corp., 50 Howard St., New York 13, N. Y.
(V)American Steel & Wire Co., U. S. Steel Corp. Subs., Rockefeller Bldg., Cleveland 13, Ohio.
(V)Anaconda Wire & Cable Co., 25 Broadway, New York 4, N. Y.
Bimbach Radio Co., Inc., 145 Hudson St., New York, N. Y.
(V)Brach Mfg. Co., 200 Central Ave., Newark 4, N. J.
(V)Columbia Wire & Supply Co., 2850 Irving Park Rd., Chicago 18, Ill.
(V)Copperweld Steel Co., Glassport, Pa.
(V)CORNISH WIRE CO., 15 Park Row, New York 7, N. Y. ADV. PG. 140.
(V)House of Television, 40 W. 4th St., New York 12, N. Y.
(V)JFD MFG. CO., 6101-23 Sixteenth Ave., Brooklyn, N. Y. ADV. PG. 254, 264.
(V)Kellogg Switchboard & Supply Co., 6650 S. Cicero Ave., Chicago 38, Ill.
(V)Locke Incorporated, P. O. Box 57, Baltimore 3, Md.
(V)Roebling's Sons Co., John A., 640 Broad St., Trenton 2, N. J.
(V)TECHNICAL APPLIANCE CORP., Sherburne, N. Y. ADV. PG. 201.
(V)Wickwire Spencer Steel Div., The, Colorado Fuel and Iron Corp., The, 500 Fifth Avenue, New York 18, N. Y.

WIRE—*Hookup*

(V)ALDEN PRODUCTS CO., 117 No. Main St., Brockton 64, Mass. ADV. PG. 235.
(V)Alpha Wire Corp., 50 Howard St., New York, N. Y.
(V)American Electric Cable Co., 181 Appleton St., Holyoke, Mass.
(V)AMERICAN PHENOLIC CORPORATION, 183 S. 54th Ave., Chicago 54, Ill. ADV. PG. 197.
(V)American Steel & Wire Co., U. S. Steel Corp. Subs., Rockefeller Bldg., Cleveland 13, Ohio.
(V)Anaconda Wire & Cable Co., 25 Broadway, New York 4, N. Y.
(V)Anonia Electrical Co., 63 Main St., Anonia, Conn.
(V)Belden Mfg. Co., 4647 W. Van Buren St., Chicago 44, Ill.
Bimbach Radio Co., Inc., 145 Hudson St., New York, N. Y.
(V)BOSTON INSULATED WIRE & CABLE CO., 61 Hay St., Boston 25, Mass. ADV. PG. 157.
(V)BRAND & CO., WM., Willimantic, Conn. ADV. PG. 120, 121.
(V)Chester Cable Corp., Chester, N. Y.
(V)Columbia Wire & Supply Co., 2850 Irving Park Rd., Chicago 18, Ill.
(V)Consolidated Wire & Associated Companies, 1635 S. Clinton St., Chicago 16, Ill.
(V)CORNISH WIRE CO., 15 Park Row, New York 7, N. Y. ADV. PG. 140.
(V)Cosser (Canada) Ltd., 301-303 Windsor St., Halifax, N. S., Canada.
(V)Diamond Wire & Cable Co., Sycamore, Ill.
(V)Dielectric Materials Co., 5315-17 N. Ravenswood Ave., Chicago 40, Ill.
Electrovox Co., Inc., 60 Franklin St., East Orange, N. J.
(V)ELECTRO-WIRE SERVICE, 5 Beekman St., New York 7, N. Y. ADV. PG. 269.
(V)Essex Wire Corp., 1601 Wall St., Fort Wayne 6, Ind.
(V)FEDERAL TELEPHONE AND RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.
(V)Federal Wire & Cable Corp., Haverstraw, N. Y.
(V)General Cable Corp., 420 Lexington Ave., New York 17, N. Y.
(V)GENERAL ELECTRIC CO., Construction Materials Dept., 1285 Boston Ave., Bridgeport 2, Conn. ADV. PG. 5 to 18.
(V)JFD MFG. CO., 6101-23 Sixteenth Ave., Brooklyn, N. Y. ADV. PG. 254, 264.
(V)LENZ ELECTRIC MFG. CO., 1751 Northwestern Ave., Chicago 47, Ill. ADV. PG. 122.
(V)PHALO PLASTICS CORP., 25 Foster St., Worcester 8, Mass. ADV. PG. 212.
(V)Phelps Dodge Copper Products Corp., 40 Wall St., New York 5, N. Y.
Philadelphia Insulated Wire Co., 220 N. 3rd St., Philadelphia, Pa.
(V)Plastic Wire & Cable Corp., Jewett City, Conn.
(V)Plastoid Corp., 10 Mill Rd., Hamburg, N. J.
(V)Product Development Co., Inc., Arlington, N. J.
(V)Rockbestos Products Corp., 308 Nicoll St., New Haven 4, Conn.
(V)ROME CABLE CORP., 330 Ridge St., Rome, N. Y. ADV. PG. 131.
(V)SURPRENANT MFG. CO., 199 Washington St., Boston 10, Mass. ADV. PG. 229.
Tensolite Corp., 7 Hudson St., N. Tarrytown, N. Y.
(V)U. S. Rubber Co., 1230 Avenue of the Americas, New York 20, N. Y.

WIRE—*Litz*

(V)Anaconda Wire & Cable Co., 25 Broadway, New York 4, N. Y.
(V)Belden Mfg. Co., 4647 W. Van Buren St., Chicago 44, Ill.
(V)Consolidated Wire & Associated Companies, 1635 S. Clinton St., Chicago 16, Ill.
(V)General Cable Corp., 420 Lexington Ave., New York 17, N. Y.
Guthman, Inc., Edwin J., 15 S. Throop St., Chicago, Ill.
(V)HUDSON WIRE CO., Winsted Div., Winsted, Conn. ADV. PG. 168.
Messner Mfg. Div., Maguire Industries, Inc., Mt. Carmel, Ill.
(V)New England Electrical Works, Inc., Lisbon, N. H.
Philadelphia Insulated Wire Co., 220 N. 3rd St., Philadelphia, Pa.
Precision Co., Arthur, Bridgeport, Conn.
(V)Stevens Wire Insulating Co., 6022 N. Rogers Ave., Pulaski & Peterson, Chicago 30, Ill.
(V)Wheeler Insulated Wire Co., Inc., 160 E. Aurora St., Waterbury 91, Conn.

WIRE—*Magnet*

(V)Acme Wire Co., New Haven 14, Conn.
(V)Alpha Wire Corp., 50 Howard St., New York, N. Y.
(V)American Steel & Wire Co., U. S. Steel Corp. Subs., Rockefeller Bldg., Cleveland 13, Ohio.
(V)Anaconda Wire & Cable Co., 25 Broadway, New York 4, N. Y.
(V)Belden Mfg. Co., 4647 W. Van Buren St., Chicago 44, Ill.
Bimbach Radio Co., Inc., 145 Hudson St., New York, N. Y.
(V)Chase Brass & Copper Co., Inc., Waterbury 91, Conn.
(V)Consolidated Wire & Associated Companies, 1635 S. Clinton St., Chicago 16, Ill.
(V)Essex Wire Corp., 1601 Wall St., Fort Wayne 6, Ind.
(V)General Cable Corp., 420 Lexington Ave., New York 17, N. Y.
(V)GENERAL ELECTRIC CO., Construction Materials Dept., 1285 Boston Ave., Bridgeport 2, Conn. ADV. PG. 5 to 18.
Goldmark Wire Co., James, 75 Murray St., New York 7, N. Y.
Guthman, Inc., Edwin J., 15 S. Throop St., Chicago, Ill.
(V)HUDSON WIRE CO., Winsted Div., Winsted, Conn. ADV. PG. 168.
Inductive Equipment Co., Gettysburg, Pa.
(V)New England Electrical Works, Inc., Lisbon, N. H.
(V)Phelps Dodge Copper Products Corp., 40 Wall St., New York 5, N. Y.
Philadelphia Insulated Wire Co., 220 N. 3rd St., Philadelphia, Pa.
(V)Rea Magnet Wire Co., E. Pontiac St., Fort Wayne, Ind.
(V)Rockbestos Products Corp., 308 Nicoll St., New Haven 4, Conn.
(V)Roebling's Sons Co., John A., 640 Broad St., Trenton 2, N. J.
(V)ROME CABLE CORP., 330 Ridge St., Rome, N. Y. ADV. PG. 131.
Seelan Co., Arthur, Bridgeport, Conn.
(V)Sprague Electric Co., North Adams, Mass.
Sun Copper & Wire Co., 132 Beckwith Ave., Paterson, N. J.
(V)Wheeler Insulated Wire Co., Inc., 160 E. Aurora St., Waterbury 91, Conn.

WIRE—*Molybdenum*

Bimbach Radio Co., Inc., 145 Hudson St., New York, N. Y.
(V)Cleveland Tungsten, Inc., 10200 Meech Ave., Cleveland, Ohio.
(V)Elsler Engineering Co., Inc., 740 S. 13th St., Newark 3, N. J.
(V)Fansteel Metallurgical Corp., 2200 Sheridan Rd., North Chicago, Ill.
(V)North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.

WIRE—*Nickel Clad Copper*

(V)Alloy Metal Wire Co., 13th & Penna Ave., Prospect Park, Pa.
(V)Elsler Engineering Co., Inc., 740 S. 13th St., Newark 3, N. J.
(V)Texas Wire Co., Inc., 70 W. First St., Olyanja, N. Y.
(V)GENERAL PLATE DIVISION, Metals & Controls Corp., Attleboro, Mass. ADV. PG. 245.
(V)Little Falls Alloys, Inc., 190 Caldwell Ave., Paterson 1, N. J.
(V)SYLVANIA ELECTRIC PRODUCTS, INC., Emporium, Pa. ADV. PG. 286 to 290.
(V)Wilson Co., H. A., The, 105 Chestnut St., Newark 5, N. J.

WIRE—*Phosphor Bronze*

(V)Alpha Wire Corp., 50 Howard St., New York, N. Y.
(V)American Electric Cable Co., 181 Appleton St., Holyoke, Mass.
(V)Anaconda Wire & Cable Co., 25 Broadway, New York 4, N. Y.
Bimbach Radio Co., Inc., 145 Hudson St., New York, N. Y.
(V)Chase Brass and Copper Co., Inc., Waterbury 91, Conn.
(V)COHN CORP., SIGMUND, 44 Gold St., New York, N. Y. ADV. PG. 176.
(V)Consolidated Wire & Associated Companies, 1635 S. Clinton St., Chicago 16, Ill.
(V)Texas Wire Co., Inc., 70 W. First St., Olyanja, N. Y.
(V)HUDSON WIRE CO., Winsted Div., Winsted, Conn. ADV. PG. 168.
(V)Little Falls Alloys, Inc., 190 Caldwell Ave., Paterson 1, N. J.
(V)North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
(V)Phosphor Bronze Corp., 20 Franklin St., Seymour, Conn.
(V)Riverside Metal Co., Riverside, N. J.
(V)Scovill Mfg. Co., Industrial Fastener Div., Waterbury, Conn.
(V)SURPRENANT MFG. CO., 199 Washington St., Boston 10, Mass. ADV. PG. 229.

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

WIRE—*Plastic Insulated*

Ⓥ ALDEN PRODUCTS CO., 117 N. Main St., Brockton 64, Mass. ADV. PG. 235.
Ⓥ Alpha Wire Corp., 50 Howard St., New York, N. Y.
Ⓥ American Electric Cable Co., 181 Appleton St., Holyoke, Mass.
Ⓥ Anaconda Wire & Cable Co., 25 Broadway, New York 4, N. Y.
Ⓥ Anchor Plastics Co., Inc., 583-541 Canal St., New York 13, N. Y.
Ⓥ Ansonia Electrical Co., 63 Main St., Ansonia, Conn.
Ⓥ BOSTON INSULATED WIRE & CABLE CO., 61 Ray St., Boston 25, Mass. ADV. PG. 157.
Ⓥ BRAND & CO., WM., Willimantic, Conn. ADV. PG. 120, 121.
Ⓥ Chester Cable Corp., Chester, N. Y.
Ⓥ Colleyer Insulated Wire Co., 249 Roosevelt Ave., Pawtucket, R. I.
Ⓥ Colonial Wire & Supply Co., 2850 Irving Park Rd., Chicago 18, Ill.
Ⓥ Consolidated Wire & Associated Companies, 1635 S. Clinton St., Chicago 16, Ill.
Ⓥ Connor (Canada), Ltd., 301-303 Windsor St., Halifax, N. S., Canada.
Ⓥ Diamond Wire & Cable Co., Sycamore, Ill.
Ⓥ Dielectric Materials Co., 5315-17 N. Ravenswood Ave., Chicago 40, Ill.
Ⓥ ELECTRO-WIRE SERVICE, 5 Beekman St., New York 7, N. Y. ADV. PG. 269.
Ⓥ Essex Wire Corp., 1601 Wall St., Fort Wayne 6, Ind.
Ⓥ FEDERAL TELEPHONE AND RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.
Ⓥ Federal Wire & Cable Corp., Haverstraw, N. Y.
Ⓥ FLADER, INC., FREDERIC, North Tonawanda, N. Y. ADV. PG. 240.
Ⓥ General Cable Corp., 420 Lexington Ave., New York 17, N. Y.
Ⓥ General Insulated Wire Works, Inc., 69 Gordon Ave., Providence 5, R. I.
Ⓥ Hazard Insulated Wire Works Div., The, Okonite Co., Wilkes-Barre, Pa.
Ⓥ HUDSON WIRE CO., Winsted Div., Winsted, Conn. ADV. PG. 168.
Ⓥ Hyvar Aluminum & Chemical Sales, Inc., 2414 Broadway, Oakland 12, Calif.
Ⓥ LENZ ELECTRIC MFG. CO., 1751 North Western Ave., Chicago 47, Ill. ADV. PG. 122.
Ⓥ Okonite Co., Canal St., Passaic, N. J.
Ⓥ PHALO PLASTICS CORP., 25 Foster St., Worcester 8, Mass. ADV. PG. 212.
Ⓥ Phelps Dodge Copper Products Corp., 40 Wall St., New York 5, N. Y.
Philadelphia Insulated Wire Co., 220 N. 3rd St., Philadelphia, Pa.
Ⓥ Plastic Wire & Cable Corp., Jewett City, Conn.
Ⓥ Plastoid Corp., 10 Mill Rd., Hamburg, N. J.
Ⓥ Roebling's Sons Co., John A., 640 Broad St., Trenton 2, N. J.
Ⓥ ROME CABLE CORP., 330 Ridge St., Rome, N. Y. ADV. PG. 133.
Ⓥ Simplex Wire & Cable Co., 79 Sidney St., Cambridge 39, Mass.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ Surprenant Mfg. Co., 199 Washington St., Boston 10, Mass. ADV. PG. 229.
Tensolite Corp., The, 7 Hudson St., N. Tarrytown, N. Y.
Ⓥ U. S. Rubber Co., 1230 Avenue of the Americas, New York 20, N. Y.
Ⓥ Whitney Blake Co., New Haven, Conn.

WIRE—*Platinum*

Ⓥ AMERICAN PLATINUM WORKS, N. J. R. R. Ave. at Oliver St., Newark 5, N. J. ADV. PG. 265.
Ⓥ Baker & Co., Inc., 113 Astor St., Newark 5, N. J.
Bishop & Co., J. Platinum Works, Malvern, Pa.
Ⓥ COHN CORP., SIGMUND, 44 Gold St., New York, N. Y. ADV. PG. 176.
Ⓥ Eastern Smelting & Refining Corp., 107-109 W. Broadway St., Boston 18, Mass.
Ⓥ GENERAL PLATE DIVISION, Metals & Controls Corp., Attleboro, Mass. ADV. PG. 245.
Lionel Chemical Co., 29 E. Madison St., Chicago 2, Ill.
Ⓥ MEY CO., J. M., 179 Elm St., Hartford, Conn. ADV. PG. 142.
Sigmon Metals Corp., 220 E. 45th St., New York 17, N. Y.
Ⓥ Wulfberg Bros. Smelting & Refining Co., 742 Market St., San Francisco 2, Calif.
Ⓥ Wilson Co., H. A., The, 105 Chestnut St., Newark 5, N. J.

WIRE—*Resistance and Filament*

Ⓥ ALDEN PRODUCTS CO., 117 N. Main St., Brockton 64, Mass. ADV. PG. 235.
Ⓥ Alloy Metal Wire Co., 13th & Penna. Ave., Prospect Park, Pa.
Ⓥ Alpha Wire Corp., 50 Howard St., New York, N. Y.
Ⓥ COHN CORP., SIGMUND, 44 Gold St., New York, N. Y. ADV. PG. 176.
Ⓥ DRIVER CO., WILBUR B., 150 Riverside Ave., Newark 4, N. J. ADV. PG. 123.
Ⓥ DRIVER-HARRIS CO., 201 Middlesex St., Harrison, N. J. ADV. PG. 117.
Goldmark Wire Co., James, 75 Murray St., New York 7, N. Y.
Ⓥ JELLIFF MFG. CORP., C. O., 200 Pequot Ave., Southport, Conn. ADV. PG. 4th.
Ⓥ Lewis Engineering Co., 92 Rubber Ave., Naugatuck, Conn.
Ⓥ North American Philips Co., 100 E. 42nd St., New York 17, N. Y.
Precision Resistor Co., 334 Badger Ave., Newark 8, N. J.
Ⓥ SYLVANIA ELECTRIC PRODUCTS, INC., 500 5th Ave., New York 18, N. Y. ADV. PG. 286 to 290.

WIRE—*Shielded*

Ⓥ ALDEN PRODUCTS CO., 117 N. Main St., Brockton 64, Mass. ADV. PG. 235.
Ⓥ Alpha Wire Corp., 50 Howard St., New York, N. Y.
Ⓥ American Electric Cable Co., 181 Appleton St., Holyoke, Mass.
Ⓥ AMERICAN PHENOLIC CORPORATION, 1830 S. 54th Ave., Chicago 50, Ill. ADV. PG. 131.
Ⓥ Anaconda Wire & Cable Co., 25 Broadway, New York 4, N. Y.
Ⓥ Ansonia Electrical Co., 63 Main St., Ansonia, Conn.
Automatic Temperature Control Co., Inc., 5232 Pulaski Ave., Philadelphia 44, Pa.
Ⓥ Belden Mfg. Co., 4647 W. Van Buren St., Chicago 44, Ill.
Birnbach Radio Co., Inc., 145 Hudson St., New York, N. Y.
Bishop & Co., J. Platinum Works, Malvern, Pa.
Ⓥ BOSTON INSULATED WIRE & CABLE CO., 61 Ray St., Boston 25, Mass. ADV. PG. 157.
Ⓥ BRAND & CO., WM., Willimantic, Conn. ADV. PG. 120, 121.
Ⓥ Carol Cable Co., 160 Middle St., Pawtucket, R. I.
Ⓥ Chase Brass & Copper Co., Inc., Waterbury 91, Conn.
Ⓥ Chester Cable Corp., Chester, N. Y.
Ⓥ Colleyer Insulated Wire Co., 249 Roosevelt Ave., Pawtucket, R. I.
Ⓥ Columbia Wire & Supply Co., 2850 Irving Park Rd., Chicago 18, Ill.
Ⓥ Consolidated Wire & Associated Companies, 1635 S. Clinton St., Chicago 16, Ill.
Ⓥ CORNISH WIRE CO., 15 Park Row, New York 7, N. Y. ADV. PG. 140.
Ⓥ Connor (Canada), Ltd., 301-303 Windsor St., Halifax, N. S., Canada.
Ⓥ Diamond Wire & Cable Co., Sycamore, Ill.
Ⓥ Dielectric Materials Co., 5315-17 N. Ravenswood Ave., Chicago 40, Ill.
Ⓥ Elliott Mfg. Co., 218 Prospect Ave., Binghamton, N. Y.
Ⓥ Essex Wire Corp., 1601 Wall St., Fort Wayne 6, Ind.
Ⓥ FEDERAL TELEPHONE AND RADIO CORP., 100 Kingsland Rd., Clifton, N. J. ADV. PG. 23 to 25.
Ⓥ Federal Wire & Cable Corp., Haverstraw, N. Y.
Ⓥ General Cable Corp., 420 Lexington Ave., New York 17, N. Y.
Ⓥ General Insulated Wire Works, Inc., 69 Gordon Ave., Providence 5, R. I.
Ⓥ Hallett Mfg. Co., 1601 Florence Ave., Inglewood, Calif.
Ⓥ J. F. D. MFG. CO., 6101-23 Sixteenth Ave., Brooklyn, N. Y. ADV. PG. 254, 264.
Ⓥ Kuthran Mfg. Co., 350 State St., Binghamton, N. Y.
Ⓥ LENZ ELECTRIC MFG. CO., 1751 North Western Ave., Chicago 47, Ill. ADV. PG. 122.
Ⓥ Lewis Engineering Co., 92 Rubber Ave., Naugatuck, Conn.
Ⓥ Okonite Co., Canal St., Passaic, N. J.
Ⓥ PHALO PLASTICS CORP., 25 Foster St., Worcester 8, Mass. ADV. PG. 212.
Ⓥ Phelps Dodge Copper Products Corp., 40 Wall St., New York 5, N. Y.
Philadelphia Insulated Wire Co., 220 N. 3rd St., Philadelphia, Pa.
Ⓥ Plastic Wire & Cable Corp., Jewett City, Conn.
Ⓥ Plastoid Corp., 10 Mill Rd., Hamburg, N. J.
Precision Tube Co., Inc., 3029 Terrace St., Philadelphia 24, Pa.
Ⓥ ROME CABLE CORP., 330 Ridge St., Rome, N. Y. ADV. PG. 133.
Ⓥ Simplex Wire & Cable Co., 79 Sidney St., Cambridge 39, Mass.
Ⓥ Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Ⓥ SURPRENANT MFG. CO., 199 Washington St., Boston 10, Mass. ADV. PG. 229.
Tensolite Corp., The, 7 Hudson St., N. Tarrytown, N. Y.
Thoburn Tubes, Shurs Lane and Lauriston St., Roxborough, Philadelphia, Pa.
Ⓥ Western Insulated Wire Co., 2421 E. 40th St., Los Angeles, Calif.
Ⓥ Whitney Blake Co., New Haven, Conn.

WIRE—*Silver Plated*

Ⓥ American Electric Cable Co., 181 Appleton St., Holyoke, Mass.
Ⓥ COHN CORP., SIGMUND, 44 Gold St., New York, N. Y. ADV. PG. 176.
Ⓥ Consolidated Wire & Associated Companies, 1635 S. Clinton St., Chicago 16, Ill.
Ⓥ Eastern Smelting & Refining Corp., 107-109 W. Broadway St., Boston 18, Mass.
Ⓥ GENERAL PLATE DIVISION, Metals & Controls Corp., Attleboro, Mass. ADV. PG. 245.
Ⓥ HUDSON WIRE CO., Winsted Div., Winsted, Conn. ADV. PG. 168.
Ⓥ Little Falls Alloys, Inc., 190 Caldwell Ave., Paterson 1, N. J.
Ⓥ MAKEPEACE CO., D. E., Attleboro, Mass. ADV. PG. 97.
Ⓥ North American Philips Co., 100 E. 42nd St., New York 17, N. Y.
Ⓥ SYLVANIA ELECTRIC PRODUCTS, INC., Emporium, Pa. ADV. PG. 286 to 290.
Ⓥ Wilson Co., H. A., The, 105 Chestnut St., Newark 5, N. J.

WIRE—*Stainless Steel*

Ⓥ Allegheny Ludlum Steel Corp., H. W. Oliver Bldg., Pittsburgh 22, Pa.
Ⓥ Alloy Metal Wire Co., 13th and Penna. Ave., Prospect Park, Pa.
Ⓥ American Steel & Wire Co., U. S. Steel Corp., Subs., Rockefeller Bldg., Cleveland 13, Ohio.
Ⓥ Carpenter Steel Co., The, 142 Weir Penn St., Reading, Pa.
Ⓥ COHN CORP., SIGMUND, 44 Gold St., New York, N. Y. ADV. PG. 176.
Ⓥ CRUCIBLE STEEL CO. OF AMERICA, 405 Lexington Ave., New York 17, N. Y. ADV. PG. 174.
Ⓥ DRIVER CO., WILBUR B., 150 Riverside Ave., Newark, N. J. ADV. PG. 123.
Ⓥ DRIVER-HARRIS CO., 201 Middlesex St., Harrison, N. J. ADV. PG. 117.
Ⓥ HUDSON WIRE CO., Winsted Div., Winsted, Conn. ADV. PG. 168.
Ⓥ Indiana Steel & Wire Co., 700 Council St., Muncie, Ind.
Ⓥ Little Falls Alloys, Inc., 190 Caldwell Ave., Paterson 1, N. J.
Ⓥ Republic Steel Corp., Republic Building, Cleveland 1, Ohio.
Ⓥ Rymsza & Son, Inc., J. T., Box 4100-A, Chicago, Ill.
Ⓥ SYLVANIA ELECTRIC PRODUCTS, INC., Emporium, Pa. ADV. PG. 286 to 290.

WIRE—*Tungsten*

Ⓥ Cleveland Tungsten, Inc., 16200 Meech Ave., Cleveland, Ohio.
Ⓥ COHN CORP., SIGMUND, 44 Gold St., New York, N. Y. ADV. PG. 176.
Ⓥ Exler Engineering Co., Inc., 743 S. 13th St., Newark 3, N. J.
Ⓥ Fansteel Metallurgical Corp., 2200 Sheridan Rd., North Chicago, Ill.
Ⓥ North American Philips Co., 100 E. 42nd St., New York 17, N. Y.
Ⓥ SYLVANIA ELECTRIC PRODUCTS, INC., Emporium, Pa. ADV. PG. 286 to 290.
Ⓥ WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 37.

WIRE RECORDER ASSEMBLIES

Air King Products Co., Inc., 170 53rd St., Brooklyn, N. Y.
Ⓥ BRUSH DEVELOPMENT CO., THE, 3405 Perkins Ave., Cleveland 14, Ohio. ADV. PG. 134, 135.
Ⓥ Lear, Inc., 110 Ionia Ave., N.W., Grand Rapids 2, Mich.
Whitaker Cable Corp., Kansas City 16, Mo.
Ⓥ Wirecraft Corp. of America, 1331 Halsey St., Brooklyn 27, N. Y.

WOOFERS

See Loudspeakers

X-RAY EQUIPMENT—*Industrial*

Ⓥ Allis-Chalmers Mfg. Co., 435 South 70th St., Milwaukee 1, Wis.
Ⓥ Dunlee X-Ray Products, Inc., 209 29th St., Brooklyn 32, N. Y.
Ⓥ Farrand Optical Co., Inc., Bronx Blvd. at 238th St., New York 66, N. Y.
Ⓥ General Electric X-Ray Corp., 4855 W. McGeoch Ave., Milwaukee, Wis.
Hanshaw Scientific Div. of The Hanshaw Chemical Co., 1945 E. 97th St., Cleveland 6, Ohio.
Ⓥ High Voltage Engineering Corp., 3 University Rd., Cambridge 38, Mass.
Ⓥ Kelley-Koett Mfg. Co., Instrument Div., 12 E. 6th St., Covington, Ky.
Ⓥ North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
Ⓥ Picker X-Ray Corp., 300 Fourth Ave., New York 10, N. Y.
Ⓥ Radiation Counter Laboratories, Inc., 1844 W. 21st St., Chicago 8, Ill.
St. John X-Ray Laboratory, Califon, N. J.
Ⓥ Standard Electronics Research Corp., 2 East End Ave., New York 21, N. Y.
Ⓥ Triplett & Barton, Inc., 831 N. Lake St., Burbank, Calif.

Ⓥ indicates . . . IN PRODUCTION • AVAILABILITY • UNRESTRICTED FOR GENERAL USE

Triplett & Barton, Inc., 831 N. Lake St., Burbank, Calif.
VICTOREEN INSTRUMENT CO., 5806 Hough Ave., Cleveland 3, Ohio. ADV. PG. 241.
WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

YOKES, DEFLECTION

A. P. W. Co., 72 W. Main St., Rockaway, N. J.
Alliance Mfg. Co., Lake Park Blvd., Alliance, Ohio.
Amplex Division, Chrysler Corp., Detroit 31, Mich.
BARKER & WILLIAMSON, 235 Fairfield Ave., Upper Darby, Pa. ADV. PG. 169.
Corona Engineering Service, 94-52 Corona Ave., Elmhurst, N. Y.
DA Radio Products Co., Inc., 2305 Armitage Ave., Chicago 47, Ill.
Dani Mfg. Co., 1129 Finderne Ave., Somerville, N. J.
DuMont Laboratories, Inc., Allen B., Electronic Parts Div., Market St., East Paterson, N. J.
GENERAL ELECTRIC CO., Electronics Dept., Electronics Park, Syracuse, N. Y. ADV. PG. 9 to 18.
Guthman Inc., Edwin T., 19 S. Throop St., Chicago, Ill.
HILLBURN ELECTRONIC PRODUCTS CO., 55 Nassau Ave., Brooklyn 22, N. Y. ADV. PG. 46.
VICTOREEN INSTRUMENT CO., 5806 Hough Ave., Cleveland 3, Ohio. ADV. PG. 241.
WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa. ADV. PG. 77.

X-RAY EQUIPMENT—*Medical*

Allis-Chalmers Mfg. Co., 935 South 70th St., Milwaukee 1, Wis.
Bar-Ray Products, Inc., 209 25th St., Brooklyn 32, N. Y.
Farrand Optical Co., Inc., Bronx Blvd. at 238th St., New York 66, N. Y.
General Electric X-Ray Corp., 4855 W. McGeoch Ave., Milwaukee, Wis.
GIBBS DIVISION, GEORGE W. BORG CORP., Delavan, Wis. ADV. PG. 198, 199.
High Voltage Engineering Corp., 7 University Rd., Cambridge 38, Mass.
Kelley-Koett Mfg. Co., Instrument Div., 12 E. 6th St., Covington, Ky.
North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
Picker X-Ray Corp., 300 Fourth Ave., New York 10, N. Y.
Radiation Counter Laboratories, Inc., 1544 West 21st St., Chicago 8, Ill.
HOULIHAN CO., T. J., 2508-14 W. Lawrence Ave., Chicago 25, Ill. ADV. PG. 27b.
I-T-E CIRCUIT BREAKER CO., 19th & Hamilton Sts., Philadelphia 30, Pa. ADV. PG. 40, 41.
K-V Transformer Corp., 4414 Park Ave., New York 57, N. Y.
Monroe Coil Co., 2839 N. Narragansett Ave., Chicago 34, Ill.
Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
RADIO CORP. OF AMERICA, RCA Victor Div., Tube Dept., Harrison, N. J. ADV. PG. 73 to 75, Inside Back and Back Covers.
ROLA CO., INC., THE, 2530 Superior Ave., Cleveland 14, Ohio. ADV. PG. 43.
Ross Mfg. Co., 860 Washington St., Burlington, Iowa.
STANDARD TRANSFORMER CORP., Elston, Kedzie & Addison, Chicago 18, Ill. ADV. PG. 62.
Tech-Master Products Co., 443-5 Broadway, New York 13, N. Y.
Telectron Co., The, 4019 Prospect Ave., Cleveland 3, Ohio.
Teleradio Engineering Corp., 99 Wall St., New York, N. Y.
Television Laboratories, Inc., 542 N. Parkside Ave., Chicago 44, Ill.
Todd-Trail Corp., 156 Gramatan Ave., Mt. Vernon, N. Y.

TRADE NAME INDEX

The following list, provided by manufacturers, comprises the registered trade names of products in or related to the electronic field. It is intended for use in determining the manufacturer's name when only a trade name is known. Addresses can be obtained by referring to the Manufacturers Index on page D-151. Only coined trade names are listed, as it was deemed unnecessary to include a company name, even though it was a registered trade name, inasmuch as the manufacturer's identity was immediately apparent.

"A" NICKEL
International Nickel Co., Inc.
A & A
Electrical Coil Winding Co.
ACA
Amplifier Corp. of America
ACE
American Hard Rubber Co.
ACE
Acro Expansion Bolt Co.
ACE
Crosley Corp.
ACME-MOLD
Acme Wire Co.
ACOUSTICEL
Brush Development Co.
ACRAWAX C
Glyco Products Co., Inc.
ACROCEL
Acromark Co.
ACROCUT
Acromark Co.
ACROD
Acme Electric Heating Co.
ACRO-ETCH
Acromark Co.
ACROFLEX
Anchor Plastics Co., Inc.
ACROGRAVE
Acromark Co.
ACROHEX
Acromark Co.
ACRO-INK
Acromark Co.
ACROM
Acme Electric Heating Co.
ACROMARKER
Acromark Co.
ACRO-PLAC
Acromark Co.
ACRO-PRINTER
Acromark Co.
ACROSNAP
Acro Electric Co.
ACROSOUND
Acro Products Co.
ACROTOOL
Acromark Co.
ACROVISION
Acro Products Co.
ACRYLOID
Rohm & Haas Co.
ACRYWELD
American Phenolic Corp.
ACTRON
Radionic Transformer Co.
ADAPTORS
ABC Radio Labs.
ADC
Audio Development Co.
ADJUSTOHM
World Radiant Electric Co.
ADJUST-A-CONE
Quam-Nichols Co.
ADJUST-A-VOLT
Standard Electrical Products Co.
ADLAKE
Adams & Westlake Co.
AEC
American Electroneering Co.
ADVANCE
Driver-Harris Co.
AECO
American Elec. Cable Co.
AERIOTRON
Westinghouse Electric Corp.
AERO
Sheffield Instrument Corp.
AEROCOM
Aeronautical Communications Equipment Co.
AEROCON
Aerovox Corp.
AERO-GUN
Sheffield Mfg. Co.
AEROLENE
Aerovox Corp.
AEROLITE
Aerovox Corp.
AERO-MAGNETTE
Aeronautic Electric Co.
"AERONAUT" PRODUCTS
Aeronautical Radio Mfg. Co.
AEROPOINT
Aero Needle Co.
AERO-SEAL
Breeze Corpos., Inc.
AERO-THREAD
Heli-Coil Corp.
AEROTROL
Acro Electric Co.
AGA
American Gas Accumulator Co.
AGASTAT
American Gas Accumulator Co.
AGWADAG
Acheson Colloids Corp.
AICO
American Insulator Corp.
AIDEX
Aldine Paper Co., Inc.
AIDRITE
Aldine Paper Co., Inc.
AIR O FRESH
Metro Products, Inc.
AIRACOUSTIC
Johns-Manville Sales Corp.
AIRBOY
Mitchell Industries, Inc.
AIR-COM
Aeronotive Equipment Corp.
AIRCORE
Communication Products Co., Inc.
AIRDESIGN
Tele-Video Corp.
AIRFLEX
Transradio Ltd.
AIRFONE
Electronic Specialty Co.
AIR INDUCTORS
Barker & Williamson
AIR-LOOP
Finkelstein Mfg. Corp., A. W.
AIR-O-LINE
Brown Instrument Co.
AIR-RAY
Ajax Electronics Co.
AIRSCOUT
Mitchell Industries, Inc.
AJAX
Sherwin Williams Co.
AJAX-NORTHRUP
Ajax Electrothermic Corp.
AJUST-A-VOLT
Standard Electrical Products Co.
AKRA-OHM
Akron Brass Mfg. Co.
ALABAX
Pass & Seymour, Inc.
ALCOA
Aluminum Company of America
ALCROHM
Magnetic Metals Co.
ALCUPLATE
General Plate Division Metals & Controls Corp.
ALDEX
Aldine Paper Co.
ALFERON
Driver-Harris Co.
ALGEO
Arkay Manufacturing Co.
ALL-HYDRAULIC
Hydraulic Press Mfg. Co.
ALNET
Alloy Metal Wire Co.
ALNOR
Illinois Testing Labs., Inc.
ALODINE
American Chemical Paint Co.
ALPHATRON
Alpha Laboratories
ALPHATRON
National Research Corp.
ALPO
Standard Varnish Works
ALRAY
Arkay Metal Wire Co.
ALROK
Aluminum Co. of America
ALSCO
Automatic Switch Co.
ALSILOY
Driver-Harris Co.
ALSIMAG
American Lava Corp.
ALSIPLATE
General Plate Division Metals & Controls Corp.
ALUMATREET
Forrester Co.
ALUMAWELD
Johnson Mfg. Co., Inc.
ALUMILITE
Aluminum Co. of America
ALUNDUM
Norton Co.
ALZAK
Aluminum Co. of America
AMINCO
American Instrument Co.
ALUMINUM OILITE
Amplex Div.
Chrysler Corp.
ALUNDUM
Norton Co.
AMBERLITE
Rohm & Haas Co.
AMBEROL
Rohm & Haas Co.
AMCO
American Solder & Flux Co.
AMCON
American Condenser Co.
AMECO
American Electronics Corp.
AMERBESTOS
American Steel & Wire Co.,
U. S. Steel Corp., Sub.
AMERCLAD
American Steel & Wire Co.,
U. S. Steel Corp., Sub.
AMERFLEX
Marco Industries
AMERGLASS
American Steel & Wire Co.
U. S. Steel Corp., Sub.
AMERICAN
Manning, Maxwell & Moore, Inc.
AMERICAN BEAUTY
American Electrical Heater Co.
AMERICAN ELECTRIC
The Kelley-Koett Mfg. Co., Inc.
AMERICAN-PHILLIPS
American Screw Co.
AMERINE
American Insulator Corp.
AMERLAC
American Electric Cable Co.
AMERPLASTIC
American Electric Cable Co.
AMERSTRAND
American Steel & Wire Co.,
U. S. Steel Corp., Sub.
AMERTRAN
American Transformer Co.
AMINCO
American Instrument Co.
AMMOGAS
Westinghouse Electric Corp.
AMO
General Cement Mfg. Co.
AMOILS
Distillation Products Industries
AMPEC
Centralab Div.
Globe-Union, Inc.
AMPHENOL
American Phenolic Corporation
AMPLICALL
Racon Ring Corp.
AMPLICORP
Amplifier Corp. of America
AMPLIMUSE
Astatic Research Labs., Inc.
AMPLI-PRESS
Aircraft-Marine Products, Inc.
AMPLISET
Pendar Co., The
AMPLUG
Electrodyne Co.
AMP-O-MATIC
Aircraft-Marine Products, Inc.
AMPROBE
Pyramid Instrument Corp.
AMPTROL
Kraft Instrument Div.
Bendix Aviation Corp.
AMPYROL
American Steel & Wire Co.,
U. S. Steel Corp. Sub.
AMRAD
Amrad Corp.
AMRECON
American Relay & Controls, Inc.
AMVAR
American Steel & Wire Co.,
U. S. Steel Corp. Sub.
ANACONDA
American Brass Co.
ANADEL
Joseph Dixon Crucible Co.
AN-COR-LOL
Anderson Rust Mfg. Co., Inc.
ANKOSEAL
Amperex Electronic Co.
ANTELCO
Automatic Electric Co.
ANTEN-A-CATOR
London Specialties Co.
ANTENNAPLEX
Radio Corp. of America
ANTI-INK
Anderson Rust & Bolt Fastener Co.
ANYVOLT
Gothard & Co.
APELCO
Apelco Electronics Co.

APW
American Platinum Works.
AQUADAG
Acheson Colloids Corp.
AQUALITE
National Vulcanized Fibre Co.
AQUALUX
Westinghouse Electric Corp.
AQUA-NIL
Standard Electrical Products Co.
AQUAPLATE
Bache & Co., Semon.
AQUIFLUX
Special Chemicals Co.
ARC-RITE
Metlaphone Corp.
ARCTURUS
Standard Arcturus Corp.
ARGOFLEX
Argus, Inc.
ARISTA
Coronet Radio & Television Corp.
ARKLESS
Economy Fuse & Mfg. Co.
ARL
Applied Research Labs.
ARLAB
Radionic Transformer Co.
ARLAVOX
Radionic Transformer Co.
ARMATITE
Mica Insulator Co.
ARMITE
Spaulding Fibre Co., Inc.
ARRESTONE
Armstrong Cork Co.
ARVIN
Noblitt-Sparks Industries
ASBESTOSPAK
Fast Products Mfg. Co.
ASCO
Automatic Switch Co.
ASHCROFT
Manning, Maxwell & Moore, Inc.
ASTRA-SONIC
The Pestron Corp.
ATC
Automatic Temperature Control Co., Inc.
ATOM
Sprague Electric Co.
ATCOTRAN
Automatic Temperature Control Co., Inc.
ATOMEER
Maico Co., Inc.
ATR
American Television & Radio Co.
ATTIC-V-BEAM
Terrex, Inc.
AUBESTON
Auburn Manufacturing Co.
AUDAX
Audax Co.
AUDIAD
Magnecord, Inc.
AUDICLE
Sonotone Corp.
AUDIGAGE
Brannon Instruments, Inc.
AUDIODISCS
Audio Devices, Inc.
AUDIOID
Jack Laboratories
AUDIOSCOPE
Sonotone Corp.
AUDITRON
Sonotone Corp.
AUDIO-LINE
Audio Equipment Sales.
AUDIO MASTER
Broadcasting Program Service
AUDIO RULE
Audio Equipment Sales
AUDIOPOINTS
Audio Devices, Inc.
AUDIO TAPE
Audio Devices, Inc.
AUDITION
Reeves Soundcraft Corp.
AUDOGRAPH
The Gray Mfg. Co.
AURICON
Kenyon Bach, Inc.
AUTOCROMATIC
Acton Co., H. W.
AUTO-DRYAIRE
Communication Products Co., Inc.
AUTODYNE
Westinghouse Electric Corp.
AUTOLUBE
International Powder Metallurgy Co.
AUTOMANIC
Premax Products Div. Chisholm-Ryder Co., Inc.
AUTOMATIC TERMINATOR
Aircraft Marine Products, Inc.
AUTOMIX
Westinghouse Electric Corp.
AUTOPLATER
Tracerlab, Inc.
AUTOSCALER
Tracerlab, Inc.
AUTOSET
Bristol Co., The
AUTO-SONIC
Vendo Co.
AUTOSYN
Eclipse Pioneer Div.
Bendix Aviation Corp.
AUTOTROL
Westinghouse Electric Corp.
AUTOTUNE
Collins Radio Co.
AUTOVALVE
Westinghouse Electric Corp.
AUTRASTAT
Ward Leonard Electric Co.
AVIGATOR
Mitchell Industries, Inc.
AWEBCO
Anchor Webbing Co.
AXIFLO
Westinghouse Electric Corp.
B-2
Peck & Harvey
B&W
Barker & Williamson
BAACH—INTERNATIONAL
International Machine Works
BABY-LISTENER
Lyman Electronic Corp.
BADGER
Reliance Automatic Lighting Co.
BALAC
Consant Laboratories.
BALOWSTER
R. G. Back Video Corp.
BANDBOX
Crosley Corp.
BANTAM
Aerovox Corp.
BANTAM GT
Hytron Radio & Electronics Corp.
BANTAM JR
Hytron Radio & Electronics Corp.
BARANM
Ward Leonard Elec. Co.
BARCOL
Barber Colman Co.
BARCOMBO
Electronic Enterprises, Inc.
BAREX
King Laboratories, Inc.
BAROHM
Ward Leonard Electric Co.
BARRYMOUNT
Barry Corp., The
BASS REFLEX
James Mfg. Co.
BATTERY SCOPE
McColpin-Christie Corp.
BATRYPOWER
Radiart Corp.
BAT'S-EYE RADARECTOR
G. G. Kennedy.
BEAVER
Cornell-Dubilier Electric Corp.
BECHAMINE
Fairchild Chemicals, Inc.
BECKMAN
National Technical Laboratories.
BECO
Brown Electro-Measurement Corp.
BECO
Westinghouse Electric Corp.
BEE
Buchanan Electrical Products Corp.
BEETLE
American Cyanamid Co.
Plastics Div.
BELCO
Hinde Electric Co.
BELFONE
Bell Sound Systems, Inc.
BELFONE MESTRO
Bell Sound Systems, Inc.
BELL-TIME
Industrial Timer Corp.
BEN HAR
Bentley, Harris Mfg. Co.
BENELEX
Monsanto Corp.
BEPCO
Buchanan Electrical Products Corp.
BERGER
Republic Steel Corp.
BERKELEY DECIMAL
Berkeley Scientific Co.
BERKSHIRE
Rome Corporation of America
"BEST PRODUCTS"
Cassor (Canada) Ltd.
BESTO-WIRE
Rhode Island Insulated Wire Co.
BETTER LIVING
Sonotone Corp.
B.I.W.
Boston Insulated Wire & Cable Co.
BIMORPH
Brush Development Co.
BINAC
Eckert-Mauchly Computer Corp.
BI-SEAL
Bishop Mfg. Corp.
BL
Browning Laboratories, Inc.
BLACK DIAMOND
Gordon Co., M. W.
BLACLINE
Frederick Post Co.
BLUE BEAVER
Sundemar Corp. of America.
BLUE STREAK
American Electric Cable Co.
BLUEBIRD
Radio Corporation of America
BOARDMASTER
Universal Drafting Machine Corp.
BONALOY
Bonney Forge & Tool Works
BOND
Olin Industries, Inc.
BONDERITE
Parker Rust Proof Co.
BOND-ROD
Sherman Mfg. Co., H. B.
BOVIE
Liebel-Flarsheim Co.
BOXSEAL
Paisley Products Inc.
BRADLEY
De Jur-Amsco Corp.
BRANDES
Cannon Co., C. F.
BRANTRONIC
Branston Electric Mfg. Co., Inc.
BRAZO
Linde Air Products Co.
Unit of Union Carbide & Carbon Corp.
BRENKERT
Radio Corp. of America
BREWSTER
Maguire Industries
BRIDGER
Audio Instrument Co.
BRILLIANTONE
Acton Co., H. W.
BRINELCO
Brinell Co., Inc
BRISTO
Bristol Co., The
BROADBAND
Racon Electric Co.
BROADCASTER
Reeves Soundcraft Corp.
BRONCO
General Plate Division
Metals & Controls Corp.
BRONCO
Western Insulated Wire Co.
BRONCO BESTON
Western Insulated Wire Co.
BRONZOCHROME
Eutectic Welding Alloys Co.
BROWN DEVIL
Ohmite Mfg. Co.
BROWN X
Pass & Seymour, Inc.
BRYANT
Westinghouse Electric Corp.
BUDGET
Aircraft Marine Products Inc.
BUG, THE
Vibroplex Co., Inc.
BUILT IN WATCHMAN
Westinghouse Electric Corp.
BULLDOG
Phelps Dodge Copper Products Corp.
BULLS-I-UNITS
Kirkland Co., H. R.
BULPLATE
Herion Corp.
BULPLATE
Sprague Electric Co.
BUNDYWELD
Bundy Tubing Co.
BUSHEND
Buchanan Electrical Products Corp.
BUSS
Bussmann Mfg. Co.
BUTACITE
E. I. du Pont de Nemours Co., Inc.
BUTTON MICAS
Erie Resistor Corp.
B&W
Barker & Williamson
BUZZ-TIME
Industrial Timer Corp.
C-B
Caldwell Burns Mfg. Co.
C & C
McColpin-Christie Corp.
CMSZ ALLOY
Electro Metallurgical Co.
Unit of Union Carbide & Carbon Corp.
CALIVOLTER
Calidyne Co., The
CALLMASTER
Lyman Electronic Corp.
CALORIMETER
Whiteman, R. A.
CAMBRIDGE
American Electric Cable Co.
CAMCO
Cinaudagraph Corp.
CANOHMS
Muter Co.
CANNON-BALL
Cannon Co., C. F.
CAPACILOG
Wheeco Instruments Co.
CAPACITROL
Wheeco Instruments Co.
CAPE COD
Submarine Signal Div.
Raytheon Mfg. Co.
CAPEHART
Capehart-Farnsworth Corp.
CAPOHMIST
Special Products Co.
CAPRISTOR
Jeffers Electronics Co.
CARBIC
Linde Air Products Co.
Unit of Union Carbide & Carbon Corp.

CARBOFILM
Wilcor Products, Inc.
CARBOLITE
Linde Air Products Co.
Unit of Union Carbide & Carbon Corp.
CARBOMITE
Continental Carbon, Inc.
CARBONYL
General Aniline & Film Corp.
CARDAK
Electro-Voice, Inc.
CARDIETTE
Sanborn Co.
CARDIOFAX
Electrofax Corp.
CARDIOSCRIBE
General Electric X-Ray Corp.
CARDIOTRON
Electro-Physical Labs., Inc.
CARDYNE
Electro-Voice, Inc.
CARILLON DYNAMIC
Miller Mfg. Co., M. A.
CARRON-AIRE
Carron Mfg. Co.
CARTRIJ-DRY
Pyramid Electric Co.
CASCADE
Audio Industries
CASCADE
Linde Air Products Co.
Unit of Union Carbide & Carbon Corp.
CASCAMITE
The Borden Co.,
Chemical Division
CASCO
The Borden Co.,
Chemical Division
CASCOPHEN
The Borden Co.,
Chemical Division
CASCOREZ
The Borden Co.
Chemical Division
CASTORDAG
Acheson Colloids Corp.
CATABOND
Catalin Corp. of America
CATAPAK
Catalin Corp. of America
CATAVAR
Catalin Corp. of America
CAT'S EYE
Fox Instrument Co.
CAVALCADE
Molded Insulation Co.
Aircraft Control Div.
CCC CHICAGO
Chicago Condenser Corp.
CCO
Billey Electric Co.
C-D SEAL
Cornell-Dubilier Electric Corp.
CECOR
Commercial Equipment Co., Inc.
CECOTITE
Cook Electric Co.
CELAB
Clark Electronic Labs.
CELASCREEN
Celanese Corp. of America
CELCON
Celanese Corp. of America
CELECTRAY
Weston Electrical Instrument Corp.
CELLO-BOND
Factory Products, Inc.
CELLUFOAM
Masonite Corp.
CELLULOID
Celanese Corp. of America
CELORON
Continental Diamond Fibre Div.
CELVACENE
Oil-Dri Corporation Products Industries
CENCO
Central Scientific Co.
CENTRALINE
Central Paper Co., Inc.
CERAMAG
Markuvic Carbon Co.
CERAMICON
Erie Resistor Corp.
CERAMICAPS
Meter Co.
CEREX
Monsanto Chemical Co.
Plastics Div.
CERISSO
Insulantile Mfg. Corp.
CEROC
Sprague Electric Co.
CERTI-CRIMP
Aircraft Marine Products, Inc.
CETRON
Continental Electric Co.
CHALLENGER
Recorder
Rek-O-Kut Co., Inc.
CHAMPION
Crucible Steel Co. of America
CHAMPION No. 180
Division Lead Co.
CHANALYST
Radio Corporation of America
CHAN-L MOUNT
Lord Mfg. Co.
CHARGALYZER
McColpin-Christie Corp.
CHARG-O-MATIC
Hertner Electric Co.
CHASS-EZ
General Cement Mfg. Co.
CHEMACO
Koppers Co.
CHEMIGLAS
Technicraft Supply Co., Radiocrafters
CHEMIFLUX
Technicraft Supply Co., Radiocrafters
CHEMIGUM
Goodyear Tire & Rubber Co.
CHERRIO
Crosley Corp.
CHEMLON
Clevite Packing Co.
CHIME-MATIC
Executone, Inc.
CHINALAK
Dodge Co., John C.
CHROMARFLASH
Rauland Mfg. Co.
CHROMAX
Driver-Harris Co.
CHROMEX
Pass & Seymour, Inc.
CHROMO-FLASH
Photographic Products, Inc.
CHRONOLOG
National Acme Co.
CHRONO-SPRAY
Paragon Electric Co.
CHRONOTRON
Eclipse Pioneer Div.
Bendix Aviation Corp.
CIMET
Driver-Harris Co.
CINCH
National Lead Co.
CINE BALOWSTAR
Jam Products Co.
CINE-VOICE
Berndt-Bach, Inc.
CIRCLATRON
Gatgets, Inc.
CIRCLE B
Bristol Motor Co.
CIRCLE-ESS
Stewart Mfg. Corp., F. W.
CIRCLET
Trumbull Electric Mfg. Co.
CIRCUITMASTER
Fairbairn Mfg. Co.
CIRCUTROLS
Kollman Instrument Div. of Square D Co.
CL
Alpha Wire Corp.
CLAM PIPE
Mueller Electric Co.
CLASSIC
Jensen Industries, Inc.
CLASSIC POINT
Eitsen Co., The
CLASSMETER
Riordan Instrument & Chemical Corp.
CLEARSITE
Economy Fuse & Mfg. Co.
CLEARSONIC
U. S. Television Mfg. Corp.
CLETALOY
Cleveland Tungsten, Inc.
CLETRON
Cleveland Electronics, Inc.
CLEVE-TUNG
Cleveland Tungsten, Inc.
CLINICAL ANALYZER
Bruckner-Mass Instruments, Inc.
CLIP ON
Ferranti Electric, Inc.
CMH
Chicago Metal Hose Corp.
COATINGAGE
Boonton Instruments, Inc.
CO-AX
Transradio, Ltd.
COAXITUBE
Precision Tube Co., Inc.
COAXWITCH
Kent-Lionetronic Corp.
COBANIC
Cobb Co., Arthur W.
CODUR
Maas & Waldstein Co.
COHARDITE
Connecticut Hard Rubber Co.
COHRLASTIC
Connecticut Hard Rubber Co.
COLONIAL
Pyramid Products Co.
COLOR EYE
Instrument Development Laboratories, Inc.
COLORTOP
Buss Fuse Mfg. Co.
COMCO
Communications Co., Inc.
COMET
Driver-Harris Co.
COMMULAC
Martindale Electric Co.
COMMUNOPHONES
Rogen Co., David
COMMUTATOR RESURFACERS
Ideal Industries, Inc.
COMPACTUATOR
Air Associates, Inc.
COMPAR
Goodyear Tire & Rubber Co.
COMPARITOL
Emery Co., Inc., George
COMPA-STATION
Motorola Inc.
COMPO
Bound Brook Oil-Less Bearing Co.
COMPO
Muter Co.
COMPREGNITE
Borden Co., The, Chemical Div.
COMTONE
Communications Co., Inc.
CONCERT
Jensen Industries, Inc.
CONCERT GRAND
Stewart-Warner Corp.
CONCERTONE
Herlant Associates
CONDENS-O-WELD
Westinghouse Electric Corp.
CONDUCTALUTE
Sauereisen Cements Co.
CONFESSIONAIRE, THE
Audio Equipment Co., Inc.
CONFIDENCER
Avionmeter Corp.
CONICAL-V-BEAM
Tayrea Inc.
CONNSONATA
Conn Ltd., C. G.
CONNSONETTE
Conn Ltd., C. G.
CONPERNIK
Westinghouse Electric Corp.
CONTROFLEX
Eagle Signal Corp.
CONTROLITE
Ward Leonard Electric Co.
CONVECTRON
Eclipse Pioneer Div.
Bendix Aviation Corp.
CONVERS-O-CALL
National Intercommunicating Systems
COOKE
R. F. Farmer Co.
COOLER-PROOF
Parsley Products Inc.
COOLIDGE
General Electric X-Ray Corp.
COPOLENE
American Phenolic Corp.
COPRENE
Maas & Waldstein Co.
COPROX
Bradley Labs., Inc.
COREPROOFE
Magnetic Metals Co.
COREX
Standard Varnish Works
CORKOUSTIC
Armstrong Cork Co.
CORMER
Cornet Radio & Television Corp.
CORNELL
Video Corp. of America
CORONON
Wilcor Products Inc.
CORONOX
Westinghouse Electric Corp.
COROX
Westinghouse Electric Corp.
CORRIB
Browne Mfg. Co.
CORULITE
Premax Products Div.
Chisholm-Ryder Co., Inc.
CORWICO
Cornish Wire Co.
COSMALITE
Cleveland Container Co., The
CO-SPIRAL
Stephens Mfg. Corp.
COTO
Coto Coil Co., Inc.
COTTONITE
Acme Wire Co.
COUNTOMATIC
Instrument Development Labs.
COUPLATE
Centralab Div.
Globe Union Inc.
COX
Commercial Research Labs., Inc.
CO-X
Boston Insulated Wire & Cable Co.
COXPROX
Bradley Labs.
CRAFTSMEN
Radio Craftsmen, Inc.
CRAPO
Indiana Steel & Wire Co.
CREME-O-WAX
General Cement Mfg. Co.
CRESCENDON
Crosley Corp.
CRESTRAN
Oxnard Transformer Corp.
CROLITE
Crowley & Co., Inc., Henry L.
CROLOY
Crowley & Co., Inc., Henry L.
CROMALOY
Linde Air Products Co.
Unit of Union Carbide & Carbon Corp.
CROTHANE
Crowley & Co., Inc., Henry L.

CRUCIBLE WELD
Westinghouse Electric Corp.
CROWN
Tele King Corp.
CRYSCON
Crystal Research Labs., Inc.
CRYSTALAB
Crystal Research Labs., Inc.
CRYSTALEAR
Brush Development Co.
CRYSTALIGNED
Magnetic Metals Co.
CRYSTALINER
Monitor Products Co.
CRYSTAL-SEAL
Gits Molding Corp.
CRYSTAL-VOX
Laureta Radio Mfg. Co.
CRYSTOGRAPH
Offner Electronics, Inc.
CRYSTOLON
Norton Co.
C S P
Westinghouse Electric Corp.
CUNICO
Arnold Engineering Co.
CUNIFE
Arnold Engineering Co.
CUNNINGHAM
Radio Corp. of America
CUPALOY
Westinghouse Electric Corp.
CUPRON
Driver Co., Wilbur B.
CUSHIONTONE
Armstrong Cork Co.
CUSTOMODE
Jensen Mfg. Co.
CYCLE-PROGRESS
Automatic Temperature Control Co.
CYCELOG
The Foxboro Co.
CYCL-FLEX
Eagle Signal Corp.
CYCLO-RAY
Frieze Instrument Div.
Bendix Aviation Corp.
CYCLO-FLEX
Wilson & Co., G. C.
CYCLO-TROL
Cyclotron Specialties Co.
CYCLOTROL
Minneapolis-Honeywell Regulator Co.
D 54
Mallory & Co., Inc., P. R.
"D" NICKEL
The International Nickel Co., Inc.
DAG
Acheson Colloids Corp.
DALBAR
Electronic Enterprises
DALE
Electronic Development Co.
DALMOTRON
Dalmo Victor Co.
DAMASCENE
Linde Chemical Co.
DAMASCITE
Amplex Div.
Chrysler Corp.
DANDEE
Amphenol Corp.
DA-NITE
Hendrie Aviation Corp.
DAVENOIL
Daven Co.
DAVOHM
Daven Co.
DC 4
Dow Corning Corp.
DC" SILICONES
Dow Corning Corp.
DC 200 and DC 500
Dow Corning Corp.
DC 703
Dow Corning Corp.
DC 801, DC 802, DC 803, DC 804
Dow Corning Corp.
DC 993 and DC 996
Dow Corning Corp.
DC 2103
Dow Corning Corp.
DE ARMOND
Rowe Industries
DE FOREST
Radio Corporation of America
DECATRAN
Meaco Products, Inc.
DECOHM
Davis Electric Co.
DEEMINIZER
Crystal Research Labs., Inc.
DE-FROST-IT
Paragon Electric Co.
DEHYDRA
Waggner, Inc.
DE-ION
Westinghouse Electric Corp.
DEKA-XTAL
Scientific Radio Products Co.
DELTAMAX
Allegheny Ludlum Steel Corp.
DELTAMAX
Arnold Engineering Co.
DEMCO
Dormitzer Electric & Mfg. Co., Inc.
DEOXIDINE
American Chemical Paint Co.
DEOXO
Baker & Co., Inc.
DENSITE
West Virginia Pulp & Paper Co.
Pulp Products Dept.
DESCO
Dietz Design & Mfg. Co.
DESPARD
Pass & Seymour, Inc.
DETECT-A-FIRE
Fenwal, Inc.
DETECTOMETER
Dillon & Co., Inc., W. C.
DETERMOHM
Ohmite Mfg. Co.
DEW POINTER
Illinois Testing Labs., Inc.
DIABO
Tibbetts Industries, Inc.
DIACLOR
Sangamo Electric Co.
DIACONE
Altec Lansing Corp.
DI-ACRO
O'Neil Irwin Mfg. Co.
DIAL
Nebel Lab., R. E.
DIALCO
Dial Light Co. of America
DIAMATROL
Standard Electronics Research Corp.
DIAMOND
Continental Diamond Fibre Co.
DIAMOND
Tetrad Corp.
DIAMOND G
Garrett Co., Inc., G. K.
DIAMOND H
Hart Mfg. Co.
DIAMOND PRODUCTS
Garrett Co., Inc., George K.
DIAMONTINE
Linick Chemical Co.
DIAPHLEX
Cook Electric Co.
DIATRON
Consolidated Engineering Corp.
DICO
Diamond Mfg. Co.
DIEFLEX
Insulation Manufacturers Corp.
DIEGRAF
Grafo Colloids Corp.
DIELITE
Wirt Co.
DI-FAN
Andrew Co.
DI-FORMED
Precision Paper Tube Co.
DILECTENE
Continental Diamond Fibre Co.
DILECTO
Continental Diamond Fibre Co.
DIMMERETTE
Ward Leonard Electric Co.
DIPLOIT
Dielectric Materials Co.
DIPMASTER
Aeroil Products Co.
DIPWITE
Special Chemicals Co.
DIPWRAP
Paisley Products Inc.
DISCALOY
Westinghouse Electric Corp.
DISCAPS
Radio Materials Corp.
DISCOHM
Ward Leonard Electric Co.
DISPATCHER
Motorola Inc.
DISPLAY KING
Cole Dorothea Mechanisms
DIVCO
Division Lead Co.
DIVIDOHM
Ohmite Mfg. Co.
DOBAR
Dobeckmun Co., The
Industrial Products Div.
DOBRO
Valco Mfg. Co.
DOG
Radio Corporation of America
DOLER
Doehler-Jarvis Corp.
DOLFLEX
Dolph Co., John C.
DOLITE
Doehler-Jarvis Corp.
DONUT
Associated Research Inc.
DOPLEX
Dobeckmun Co., The
Industrial Products Div.
DOISMETER
Instrument Development Labs.
DOT
United-Carr Fastener Corp.
DOWMETAL
Dow Chemical Co.
D. R. C.
Davis Radio Corp.
DRIMETER
Fielden Electronics Inc.
DRI-N-TITE
Horn Co., Inc., A. C.
DRIOX
Linde Air Products Co.
Unit of Union Carbide & Carbon Corp.
DRITHERM
North American Electric Lamp Co.
DU KANE
Operadio Mfg. Co.
DU NOUY
Central Scientific Co.
DUAL DANDEE
Aerovox Corp.
DUALDRUM
Gorrell & Gorrell
DUAL-HORN
Brociner Electronics Laboratory
DUART
Maas & Waldstein Co.
DUBLER
Precision Plastic Products Inc.
DUBL-X
Telrex, Inc.
DUCO
E. I. du Pont de Nemours & Co., Inc.
DUCON
Dual-Remote Control Co.
DULAC
Maas & Waldstein Co.
DULUX
E. I. du Pont de Nemours & Co., Inc.
DUOCARB
Driver Co., Wilbur B.
DUOCRE X
Horn Co., Inc., A. C.
DUODIAL
Hellipot Corp.
DUO-FLEX
Dumore Co., The
DUO-PULSE
Automatic Temperature Control Co., Inc.
DUOSCALE
Tracerlab, Inc.
DUO-SEAL
Welch Scientific Co., W. M.
DUO-SPEED
W-M Corp.
DUPLEX
Altec Lansing Corp.
DURALINE
Universal Drafting Machine Corp.
DURALON
U. S. Stoneware Co., The
DURASHIELD
Plastic Fabricators Co.
DURATAPE
Ratan Instruments, Inc.
DURATIP
Weller Mfg. Co.
DURATRON
Hofmann Corp., C. L.
DURITE
Borden Co., The, Chemical Div.
DURO
Rogers Corp.
DUROID
Rogers Corp.
DUTCH BOY
National Lead Co.
DX MASTERSPEAKERS
DX Radio Products Co., Inc.
DYEPRINT
Times Facsimile Corp.
DYKANOL
Cornell-Dubilier
Electric Corp.
DYNACOIL
Crosley Corp.
DYNAGAGE
Photocon Research Products
DYNALOG
Foxboro Co., The
DYNAMASTER
Bristol Co., The
DYNAPHONE
Amrey Radio Corp.
DYNA-TACH
Electric Tachometer Corp.
DYNATHERM
American Diathermy Productions
DYNATONE
Amrey Radio Corp.
DYNATONE
Crosley Corp.
DYNETRIC
Gisholt Machine Co.
DYNETRIC
Westinghouse Electric Corp.
DYNOGRAPH
Annis Co., R. B.
DYNOGRAPH
Offner Electronics, Inc.
DYNOID
McQuay-Norris Mfg. Co.
E. A. D.
Eastern Air Devices, Inc.
"E" NICKEL
The International Nickel Co., Inc.
EAI
Electronic Associates, Inc.
EARSET
Telex, Inc.
EASY-FLO
Handy & Harman
EBROK
Richardson Co.
ECCO
Triad Transformer Mfg. Co.

ECHOPHONE
Radiocrafters Co.
ECKCO
Eckstrom Radio & Television Co.
ECO
Economy Fuse & Mfg. Co.
ECONOFLEX
Elliott Mfg. Co.
ECONO-SLIDE
Grant Pulley & Hardware Co.
EDGEOHM
Ward Leonard Electric Co.
EDIPHONE
Edison Inc., Thomas A.
EDIPROBE
Electronic Designs, Inc.
EDUCATOR
Operadio Mfg. Co.
EDUCATOR
Wilcox-Gay Corp.
EEI
Electronic Enterprises Inc.
EICO
Electronic Instrument Co. Inc.
8-BALL
Ward Products Corp., Div. of The Gabriel Co.
EIMAC
Eitel-McCullough, Inc.
EJECT-O-MATIC
Multi-Products Tool Co.
EKOTAPE
Webster Electric Co.
EL
Electrons, Inc.
ELASTOBOND
Paisley Products, Inc.
ELASTRON
Industrial Synthetics Corp.
ELCOFONE
Local Electronics Corp.
ELECTONE
Northeastern Engineering, Inc.
ELECTR O VANE
Brown Instrument Co.
ELECTREX
Gorrell & Gorrell
ELECTRICORD
Pacific Electricord Company
ELECTRITE
West Virginia Pulp & Paper Co.
Pulp Products Dept.
ELECTRIX
U. S. Rubber Co.
ELECTRO-CAL
Industrial Electronics, Inc.
ELECTROCAM
Westinghouse Electric Corp.
ELECTRO-COUNTER
Laning Engineering Co., Electronics Div.
ELECTROD
Tektronix Corp.
ELECTRO-LARYNX
Aurex Corp.
ELECTROLIMIT
Pratt Whitney Div., Niles-Bement-Pond Co.
ELECTROMANOMETER
Sanborn Co.
ELECTRO-MATIC
Automatic Signal Div.
ELECTROMAX
Leeds & Northrup Co.
ELECTROMET
Electro Metallurgical Division
Union Carbide & Carbon Corp.
ELECTRON MELL
Rigo & Jeffries, Inc.
ELECTRONAMIC
Precision Apparatus Co.
ELECTRONIC DOORMAN
John T. O'Connor & Co.
ELECTRONIC EAR
Syntone Corp.
ELECTRONIC FEATHER
Westinghouse Electric Corp.
ELECTRONIC HANDYMAN
John T. O'Connor & Co.
ELECTRONIK
Minneapolis Honeywell Regulator Co.
ELECTROPHOT
Adair & Rhamstine
ELECTROPHOTOMETER
Photoresearch Co.
ELECTROSE
Precision Mfg. Co.
ELECTROTEMP
Westinghouse Electric Corp.
ELECTROTHERM
Thermonic Engr. Corp.
ELECTROX
Ellison Mfg. Corp.
ELECTR-O-VANE
Minneapolis Honeywell Regulator Co.
ELECTUNER
General Instrument Corp.
ELENCO
Electronic Engineering Corp.
ELEPHANT
Phosphor Bronze Corp.
ELINCO
Electric Indicator Co.
ELINCOR
Electronic Indicator Corp.
ELNALOY
P. R. Mallory & Co., Inc.
ELKONITE
P. R. Mallory & Co., Inc.
ELKONIUM
P. R. Mallory & Co., Inc.

ELLANAR
L. & R. Mfg. Co.
EL-MENCO
Electro Motive Mfg. Co.
ELMET
North American Philips Co., Inc.
ELVANOL
E. I. du Pont de Nemours & Co., Inc.
EMC
Electric Motor Corp.
EMDECO
Magnetic Devices Corp.
EMICO
Electro-Mechanical Instrument Co.
EMPCO
Electronic Mechanical Products Co.
EMPIRE
Mica Insulator Co.
EMPIRE
Russell, Burdsall & Ward Bolt and Nut Co.
ENAMELITE
Acme Wire Co.
ENDURO
Republic Steel Corp.
ENDUR-PRENE
General Insulated Wire Works, Inc.
ENE-VOLT
Gorrell & Gorrell
ENPO
Enpo Machine & Mfg. Co.
EONITE
U. S. Rubber Co.
EOPRENE
U. S. Rubber Co.
EPCO
Etched Products Corp.
EPLAB
Epsley Lab., Inc., The
EQUALOAD
Electrone Carbon Co., Inc.
ERSIN MULTICORE
Multicore Sales Corp.
ESCO
Electric Specialty Co.
ESICO
Electric Soldering Iron Co.
ESNA
Elastic Stop Nut Corp. of America
ES-NAILS
Elastic Stop Nut Corp.
ETHOCEL
Dow Chemical Co.
ETHYLON
American Phenolic Corp.
ETCO
Electronic Transformer Co., Inc.
EUREKA
Morse Co., Frank W.
EUTEC-SILVER-WELD
Eutectic Welding Alloys Corp.
EUTECHROM
Eutectic Welding Alloys Corp.
EUTECROD
Eutectic Welding Alloys Corp.
EUTECTOR
Eutectic Welding Alloys Corp.
EUTECTRODE
Eutectic Welding Alloys Corp.
EVABRITE
Burke & Co., Samuel
EVALAST
Burke & Co., Samuel
EVEN-BREAK
Electric Eye Equipment Co.
EVENRAY
Fostoria Pressed Steel Corp.
EVERLASTING
Harper Co., The, H. M.
EVELYN
Rubicon Co.
EVEREADY
National Carbon Division
Union Carbide & Carbon Corp.
EVERLOCK
Thompson-Bremer & Co.
EVER-LOK
Russell & Stoll Co., Inc.
EXCELLALL
Frederick Post Co.
EXIDE
Electric Storage Battery Co.
EXPLAINETTE
Cornell Mfg. Co.
EYE WITNESS
Radio Corporation of America
E-Z
Pyramid Products Co.
E-Z CODE
Western Lithograph Co.
E-Z Code Div.
E-Z CUE
Amphlett Corp. of America
FARADON
Harper Rubber Electric Corp.
FARATRON
Gudmunsen Electric Co.
FARCO
Farrelloy Co.
FASTACK
Paisley Products, Inc.
FASTENEERING
Central Screw Co.
FASTICK
Paisley Products, Inc.
FASTOP
Tem-Tex, Inc.
FATHOMETER
Kelvin & Mfg. Co.

FAST'S
Rogers Co., Inc.
FAXIMILE
Hogan Laboratories, Inc.
FAXPAPER
Hogan Laboratories, Inc.
FEATHERIDE
Webster Electric Co.
FEDCO
Federal Engineering Co.
FEDERAL RECORDER
Dage Ltd., C. G.
FEL-PAK
Felt Products Mfg. Co.
FEL-PRO
Felt Products Mfg. Co.
FENOX
Bakelite Corp.
FERRAMIC
General Ceramics & Steatite Corp.
FERRET
Coastwise Electronic Co., Inc.
FERROTUNE
S-W Industries Co.
FIBERGLAS
Owens-Corning Fiberglas Corp.
FIBRACOUSTIC
Johns Manville Sales Corp.
FIBESTOS
Monsanto Chemical Co., Plastics Div.
FIBRETONE
Johns Manville Sales Corp.
FIDELITONE
Permo, Inc.
FIFTY-FOUR
Cardwell Mfg. Corp., Allen D.
FILMGRAPH
Miles Reproducer Co., Inc.
FILMSCRIBER
Miles Reproducer Co., Inc.
FILNIC
Driver-Harris Co.
FILPEC
Centralab Div., Globe Union Inc.
FILTERETTE
Deutschmann Corp., Tobe
FILTERNOYS
Continental Carbon, Inc.
FILTERS L
Sprague Electric Co.
FILTERVOLT
Inductive Corp. of America
FIRE DEVIL
Littelfuse, Inc.
FIREYE
Combustion Control Corp.
FISHERFONE
Fisher Research Lab.
FIVER
Paisley Corp.
FLAG GRIP
Aircraft Marine Products, Inc.
FLAME-OTROL
Wheelco Instrument Co.
FLAME-WARDEN
Combustion Research Laboratories, Inc.
FLASH
Gordon Electric Co.
FLATACK
Paisley Products Inc.
FLATWRAP
Paisley Products Inc.
FLEET CONTROL
Hammarlund Mfg. Co.
FLEXAGUIDE
Burton Inc.
FLEX-A-POWER
Trumbull Electric Mfg. Co.
FLEXARC
Westinghouse Electric Corp.
FLEXFLAT
Paisley Products Inc.
FLEXIFONE
Operadio Mfg. Co.
FLEXILUGS
Erskine Connector Co.
FLEXISPLICES
Erskine Connector Co.
FLEXITIP
Weller Mfg. Co.
FLEXI-TROL
Wilson & Co., G. H.
FLEXITONE
Operadio Mfg. Co.
FLEXITUBE
Walter G. Schott Co.
FLEXLOC
Standard Pressed Steel Co.
FLEXOPULSE
Eagle Signal Corp.
FLEX-SOK
Stupakoff Ceramic & Mfg. Co.
FLEX-STAFF
Plymouth Chemical Co.
FLEXTACK
Paisley Products Inc.
FLIGHT COM
Communications Co., Inc.
FLIGHTWEIGHT
Bendix Aviation Corp.
FLIPON
Westinghouse Electric Corp.
FLOATING JEWEL
Simpson Corp.
FLOOD-FLASH
Photoflect Company
FLOSOL
American Chemical Paint Co.

FLOTROL
Lorain Products Corp.
FLOWRATOR
Fischer & Porter Co.
FLUORADEX
Westinghouse Electric Corp.
FLUORO-RECORD
Fairchild Camera & Instrument Corp.
FLUOROSPOT
Westinghouse Electric Corp.
FLUOROVUE
Westinghouse Electric Corp.
FLUSH-LITE
Litelfuse, Inc.
FLUTO
Pass & Seymour Inc.
FLUTOLIER
Pass & Seymour Inc.
FLUX GATE
Eclipse-Pioneer Div., Bendix Aviation Corp.
FLUXRITE
National Lead Co.
FM G
General Controls Co.
F. N. A.
Paisley Products, Inc.
FOOTROL
General Control Company
FORMICA
Ford Radio & Mica Corp.
FORTICEL
Celanese Corp. of America
FORTISAN
Celanese Corp. of America
"49" ALLOY
Magnetic Metals Co.
FOSTERITE
Westinghouse Electric Corp.
FOTOLECTRIC
Worner Electronic Devices
F. P. INDUCTUNER
Mallory & Co., Inc., P. R.
FRAHM
Biddle Co., James G.
FREE-CUT INVAR "36"
Carpenter Steel Co.
FREED-EISEMANN
Freed Radio Corp.
FREE-VANE
Bristol Co., The
FREQUEMATIC
Federal Telephone & Radio Corp.
FROST
Chicago Telephone Supply Corp.
FURNATRON
Westinghouse Electric Corp.
FURZEHILL
American British Technology, Inc.
FUSETRON
Bussmann Mfg. Co.
FUSTATS
Bussmann Mfg. Co.
FYBERGLASS
Fraser Co., Inc.
Roth Wire Stripper Div.
FYBEROID
Wilmington Fibre Specialty Co.
GI
General Industries Co.
G-C
General Cement Mfg. Co.
G-MAX
Guest Research Engineering Corp.
G-METER
Schottland, Frederick D.
GALVANOID
Wickwire Spencer Steel Div., Colorado Fuel & Iron Corp.
GALVEX
Wickwire Spencer Steel Div., Colorado Fuel & Iron Corp.
GAMMATRON
Heintz & Kaufman Ltd.
GARCEAU
Electro-Medical Lab., Inc.
GEMCOTE
Gemloid Corp.
GEMFLEX
Gemloid Corp.
GEMGLEEN
Gemloid Corp.
GEMLIKE
Gemloid Corp.
GEMLITE
Gemloid Corp.
GEMLOID
Gemloid Corp.
GEMWELD
Gemloid Corp.
GENEMOTOR
Carter Motor Co.
GENERAL BRAND
General Dry Batteries, Inc.
GENERALITIES
Firstools Pressed Steel Corp.
GENEVALOC
Bendix Aviation Corp., Pacific Div.
GEN-RAL
Mater Co.
GEON
Goodrich Chemical Co., B. F.
GIBSILOY
Gibson Electric Co.
GIBSON SPRINGS
Associated Spring Corp.
GLAMORTONE
Crosley Corp.
GLASOHM
Clarostat Mfg. Co., Inc.
GLASS SEALING "42", "426", "49"
Carpenter Steel Co.
GLASSMIKE
Condenser Products Co.
GLASTIC
Laminated Plastics, Inc.
GLENNITE
Gurton Mfg. Corp.
GLIDER
Shure Brothers
GLOBAL
Molded Insulation Co., Aircraft Control Div.
GLOBAR
Carborundum Co.
GLOBE TROTTER
Radio Corporation of America
GLO-TECH
Fischer & Porter Co.
GLYDAG
Acheson Colloids Corp.
GOLDEN BEAM
Motorola Inc.
GOLDEN THROAT
Radio Corporation of America
GOLDEN VIEW
Motorola Inc.
GOLDEN VOICE
Motorola Inc.
GOLD-SEAL
Miller Co., B. F.
GOODELL
Minnesota Electronics Corp.
GOOD-RITE
Goodrich Chemical Co., B. F.
GOTHAM
Shevers Inc., Harold
GOTHARD
Johnson Co., E. F.
G-P
Erie Resistor Corp.
GRACOIL
Gramer Co., The
GRAFOIL
Bruno Development Co.
GRAFOLUX
Grafo Colloids Corp.
GRAFO CONCENTRATE
Grafo Colloids Corp.
GRALAB
Dumont-Terry Co.
GRANODINE
American Chemical Paint Co.
GRAPHALLOY
Graphite Metallizing Corp.
GRAVIGAGE
Ess Instrument Co.
GREENOHM
Clarostat Mfg. Co., Inc.
GRENZ
Westinghouse Electric Corp.
GRIDNIC
Driver-Harris Co.
GRIP-HOLD
JFD Mfg. Co.
GRIP-POINT
Waco Products Co.
GRIP TIGHT
Paisley Products, Inc.
GRIPMASTER
Parker Co., George
GRIPPER
Scovill Mfg. Co., Industrial Fastener Div.
GRIPTITE
Stevens-Walden, Inc.
GRIP-X
Rattan Mfg. Co., The
GRIZZLY
U. S. Rubber Co.
GUEST TELEVISION
Industrial Television, Inc.
GUITAN
Rooto Industries
GYRO
Sperry Gyroscope Co.
GYROPILOT
Sperry Gyroscope Co.
GYROSYN
Sperry Gyroscope Co.
HABIRLENE
Phelps Dodge Copper Products Corp.
HABIRSHAW
Phelps Dodge Copper Products Corp.
HAFTSON
Hatt & Son, Inc.
HALLOWELL
Standard Pressed Steel Co.
HALOWAX
Union Carbide & Carbon Corp.
HAM CRYSTALS
Nebel Lab., R. E.
HAMMERTONE
Maas & Waldstein Co.
HANDI-GLOW
Industrial Devices Inc.
HANDI-PHONE
Murdock Mfg. Co., Wm. J.
HANDIE TALKIE
Motorola, Inc.
HANDY ANDY
Rattan Mfg. Co., The
HANDY-FLUX
Handy & Harman
HANDYVAR
Martindale Electric Co.
HAR-CAM
Harvey Radio Labs., Inc.
HARTRON
Hart & Co., Inc. Frederick.
HARVEL
Irvington Varnish & Insulator Co.
HARVEY
Harvey Wells Electronics, Inc.
HARVEY
Peck & Harvey
HASCROME
Haynes Stellite Co.,
Unit of Union Carbide & Carbon Corp.
HASTELLOY
Haynes Stellite Co.,
Unit of Union Carbide & Carbon Corp.
HAYSTELLITE
Haynes Stellite Co.,
Unit of Union Carbide & Carbon Corp.
HAZACODE
Hazard Insulated Wire Works Div.,
The Okonite Co.
HAZACORD
Hazard Insulated Wire Works Div.,
The Okonite Co.
HAZAKROME
Hazard Insulated Wire Works Div.,
The Okonite Co.
HAZARDEX
Hazard Insulated Wire Works Div.,
The Okonite Co.
HAZEGAGE
Ess Instrument Co.
HC
Nebel Lab., R. E.
HEAD
Industrial Electronics, Inc.
HEATEX
Acme Wire Co.
HEATH KIT
Heath Co.
HEETMASTER
Aeroil Products Co.
HEETMOR
Acme Electric Heating Co.
HELIOFLASH No. 124
MacLeod & Hanopol
HELI-O-LITES
C. T. Pease Co.
HELIOS
Keuffel & Esser Co.
HELISCOPE
Crosley Corp.
HERCO
Hercules Electric & Mfg. Co., Inc.
HERCULES
Accumark Co.
HERCULES
Rubicon Co.
HERCULES
Shure Brothers, Inc.
HERECROL
Hercules & Chemical Co.
HERMETICIAN
Fusite Corp.
HERMICO
Hermetic Seal Products Co.
HEX-LOK
Boots Aircraft Nut Corp.
HEXLOX
Prestol Corp.
HEX-SCRU
Stronghold Screw Products
HEYCO
Heyman Mfg. Co.
HI-BALL
Radiart Corp.
HI-FARAD
Aerovox Corp.
HI-FLUX
Annis Co., R. B.
HI-G
General Controls Co.
HIGH PERMEABILITY "49"
Carpenter Steel Co.
HIGH STABILITY
Welwyn Electronic Components Co.
HI-KAPS
Centralab Div.
Globe Union, Inc.
HI-K CERAMICONS
Erie Resistor Corp.
HINJON
Thomas & Betts Co., Inc.
HIPERCO
Westinghouse Electric Corp.
HIPERNIK
Westinghouse Electric Corp.
HIPERSIL
Westinghouse Electric Corp.
HIPOWER
Radiart Corp.
HI-Q
Electrical Reactance Corp.
HIS MASTER'S VOICE
Radio Corporation of America
HI-TEMP
Dielectric Materials Co.
HI-TEMP
Rome Cable Corp.
HI-VOLT
Industrial Devices, Inc.
HYVOKAPS
Centralab Div.
Globe Union, Inc.

HOBBY-FLEX
Dumore Co., The
HOLD-HEET
Russell Electric Co.
HOLD-TITE
U. S. Rubber Co.
HOLLYTRAN
Transformer Engineers
HOLTITE
Continental Screw Co.
HOMAC
Hose-McCann Telephone Co., Inc.
HOMEASE
Bogue Electric Mfg. Co.
HORNAC
Horn Co., Inc., A. C.
HORNET
New York Transformer Co., Inc.
HOT NAILS
House of Television, Inc.
HOUSE OF HEARING
Sonotone Corp.
HP
Hewlett-Packard Co.
HQ-129-X
Hammarlund Mfg. Co.
H. R. S.
Dixie and Co., Inc., P. E.
HUMIDIGRAPH
Bristol Co., The
HUMIDI-STEEL
Paramount Electric Co.
HUMIDOLAIN
Star Porcelain Co.
HURLETRON
Electric Eye Equipment Co.
HUSITE
Hyde Liberty Mica Co.
HUSHATONE
Bruno Development Co.
HUSKY
Price Electric Corp.
HYCAR
Goodrich Chemical Co., B. F.
HYDENT
Burndy Engineering Co.
HYDEWA
Leon J. Barrett Co.
HYDEX
Jensen Mfg. Co.
HYDRAMOTOR
General Controls Co.
HYDRAULIC
White Rodgers Electric Co.
HYDROCORDER
Raymond Rosen Engineering Products, Inc.
HYDROGRAF
Grafo Colloids Corp.
HYDROSEC
U. S. Rubber Co.
HY-EFF
Eyer, Mfg. Co.
HYFLEX
Insulation Varnish & Insulator Co.
HYFLUX
Indiana Steel Products Company
HYHERVAC
Central Scientific Co.
HYLINK
Burndy Engineering Co.
HY-LOW
Stevens Products Inc.
HYLUG
Burndy Engineering Co.
HYMU
Magnetic Metals Co.
HYMU "80"
Carpenter Steel Co.
HYPASS
Sprague Electric Co.
HYPER
Rowe Music Corp.
HYPER-MAG
Rowe Music Corp.
HYPERSONIC
Bruno Development Co.
HYPERVAC
Central Scientific Co.
HYPEX
Jensen Mfg. Co.
HYPOT
Associated Research, Inc.
HYPRESS
Burndy Engineering Co.
HY-PUSS
Sprague Electric Co.
HY-Q 75
Hytron Radio & Electronics Corp.
HYSTERSET
Ward Leonard Electric Co.
HYTEMCO
Driver-Harris Co.
HYTOOL
Burndy Engineering Co.
HYVAC
Central Scientific Co.
HYVOL
Aerovox Corp.
ICA
Insuline Corp. of America
I. D. C.
Motorola Inc.
ICE-STIK
Rawley Products, Inc.
ICONIC
Altec Lansing Corp.

IDECO
International Derrick & Equipt. Co.
IGNITO-CHEK
Ionic Equipment Co.
ILLINI-HYCAPS
Illinois Condenser Co.
ILLITRON
Illinois Tool Works, Electronics Div.
IMC
Insulation Mfrs. Corp.
IMCOR
Insulation Manufacturers Corp.
IMMERSATHERM
Marsrod Corp.
IMPEDOMETER
Electrosyne Company.
IMPERIAL
Indiana Steel & Wire Co.
IMPREGNITE
Standard Varnish Works
INCA
Phelps Dodge Copper Products Corp.
INCELOID
American Products Mfg. Co.
INCO
International Nickel Co., Inc., The
INCONEL
Atlas Metal Wire Co.
INCONEL
International Nickel Co., Inc., The
INCREVOLT
Sorensen & Co.
INDALLOY
Indiana Steel Products Company
INDCO
Industrial Condenser Corp.
INDELCO
Industrial Electronics Co., Inc.
INDUCTOROIDS
De Coursey Engr. Lab.
INDUCTOTHERM
General Electric X-Ray Corp.
INDUCTUNER
Mallory & Co., Inc., P. R.
INDUR
Reilly Tar & Chemical Corp.
INDUSTRIAL TELECEIVERS
Industrial Television, Inc.
INERTAIRE
Westinghouse Electric Corp.
INERTEEN
Westinghouse Electric Corp.
INET
Industrial Electronics & Transformer Co.
INFERNOCOTE
Wirt Co.
INMANCO
Insulation Manufacturers Corp.
INPUTROLS
Wheelco Instruments Co.
IN-RES-CO
Instrument Resistors Co.
INSA-LUTE
Sauereisen Cements Co.
INSANOL
Westinghouse Electric Corp.
INSL
Insl-x Co., Inc.
INSL-X
Centro Research Laboratories, Inc.
INSTAGRAPH
Instagraph Co., The
INSTANSOLDER
Cole Radio Works
INSTOMATIC
Kinborn Co.
INSULAZED
Magnetic Metals Co.
INSULCON
Insulation Ceramic & Mfg. Co.
INSUROK
The Richardson Co.
INTELIN
Federal Telephone & Radio Corp.
INTERLINK
Federal Telephone & Radio Corp.
INTER-VIEWER
Lenkurt Sales Co.
INTUC
Insulating Tube Co.
INVAR "36"
Carpenter Steel Co.
IONOTRON
U. S. Radium Corp.
IRC
International Resistance Co.
IRIS
American Scientific Co.
IRN
Williams & Co., C. K.
IRON OILITE
Amplex Div.
Chrysler Corp.
IRRADIOMETERS
Sensitive Research Instrument Co.
IRV-O-LITE
Insulation Varnish & Insulator Co.
IRV-O-VOLT
Insulation Varnish & Insulator Co.
ISO-ELASTIC
John Chatillon & Sons
ISOMODE
M-I-R Mfg. Co.
ISOPLANE
Motorola Inc.
ISO-Q
Isolantite Mfg. Corp.

ISO-Q
Motorola Inc.
ISO-RAMIC
John Meck Industries
ISOTRON
Consolidated Engineering Corp.
ITELITE
I-T-E Circuit Breaker Co.
IVI-FLEX
Irvington Varnish & Insulator Co.
IVORY X
Pass & Seymour, Inc.
JACK KNIFE
Radio Merchandise Sales
JACKLEAN
Commercial Radio Sound Corp.
JADE POWDER
Linick Chemical Co.
JAGABI
Biddle Co., James G.
JECO
Jarvis Electronics Corp.
JERKIT
Littelfuse Inc.
JETFLEX
Cook Electric Co.
JETLINE
Carbonneau Industries Inc.
JIFFY
Mineralac Electric Co.
JK
James Knights Co.
J. M.
Paisley Products, Inc.
JOHN CRANE
Crane Packing Co.
J-T
Jefferson-Travis, Inc.
JUPITER GUM
Paisley Products, Inc.
K 42 B
Westinghouse Electric Corp.
"K" MONEL
The International Nickel Co., Inc.
"KR" MONEL
The International Nickel Co., Inc.
K-TRAN
Automatic Mfg. Co.
KALWOOD
Keller Products, Inc.
KANTARK
Trus-Fuse Mfg. Co.
KANTLINK
Positive Lock Washer Co.
KANTLINK
American Nut & Bolt Fastener Co.
KAPPA
Wright & Sons Co., William E.
KARADIO
I-Electron Radio & Television Co.
KARBOMET
Driver-Harris Co.
KARMA
Driver-Harris Co.
KARRO PAK
Kett Products Mfg. Co.
KATHANODE
Exide Storage Battery Corp.
KATOLIGHT
Kato Engineering Co.
KAYGREY
Rogers Corp.
KAYPAR
Rogers Corp.
KAYROK
Rogers Corp.
KELLER POLYGRAPH
Associated Research, Inc.
KELEKET
Kelly-Koett Mfg. Co., Inc., The
KEMGO
Markem Machine Co.
KENEX
Westinghouse Electric Corp.
KENITE
Kaynine Electronics Co.
KEN-RAD
General Electric Co.
KETOS
Crucible Steel Co. of America
KIC
Kennel Division, Union Carbide & Carbon Corp.
KERATYM
Horn Co., Inc., A. C.
K-H
Kienzle-Hite Instrument Co.
KILOVOLTER
Ferguson Wurtz Mfg. Co.
KING
Electric Heat Control Co., The
KING MARKWELL
Markem Machine Co.
KINSETTE
Kinsey Radio Mfg. Co.
KITCHENAIRE
Rodin Craftsmen
KITCHENOLA
Rodin Craftsmen
KLAMP-TITE
I-T-E Circuit Breaker Co.
KLEER-VU
American Kleer-Vu Plastics
KLIPLOK
Trus-Fuse Mfg. Co.
KLIPSCHORN
Klipsch & Associates
KLIPXIT
Vaco Products Co.

KLIXON
Spencer Thermostat Co.
KLYDONOGRAPH
Westinghouse Electric Corp.
KNIGHT
Allied Radio Corp.
KNOCKOMETER
Sperry Gyroscope Co.
KODAGRAPH
Eastman Kodak Co.
KODAK
Eastman Kodak Co.
KOHINOOR
Waldes Kohinoor, Inc.
KOILED KORD
Kellogg Switchboard & Supply Co.
KOLORDISK
Central Div., Globe Union Inc.
KONAL
Westinghouse Electric Corp.
KON-NEC-TOR
General Electric Co.
KOOLOHM
Sprague Electric Co.
KOTAL
U. S. Rubber Co.
KOTRON
Standard Arcturus Corp.
KOVAR
Stupakoff Ceramic & Mfg. Co.
KOVAR
Westinghouse Electric Corp.
KOVAR-ZIP
Waldes Kohinoor, Inc.
KRISTON
Swedish Chemical Co., B. F.
KROME KOAT
General Cement Mfg. Co.
KRYSTAL KOAT
General Cement Mfg. Co.
K-TRAN
Automatic Mfg. Corp.
KUPEC
Centralab, Div. Globe Union, Inc.
K-V-O
Sprague Electric Co.
KWIKFLUX
Special Chemicals Co.
KWIK-KALL
J. M. Loge Sound Engineers
"L" NICKEL
The International Nickel Co., Inc.
LABVOLT
Electrofuse Co.
LACKON
Sun Dial Corp.
LAMCO
La Magna Mfg. Co., Inc.
LAMICOID
Mica Insulator Co.
LAMICOID
Insulating Fabricators, Inc.
LAMICORES
Magnetic Metals Co.
LAMIFORM
Laminoid Fabricators
LAMINAC
American Cyanamid Co., Plastics Div.
LAMIPACKS
Magnetic Metals Co.
LAMITEX
Franklin Fibre-Lamitex Corp.
LAUXEIN
Monsanto Chemical Co., Plastics Div.
LAUXITE
Monsanto Chemical Co., Plastics Div.
LAVA
Kirchberger & Co., Inc., M.
LAVITE
Steward Mfg. Co., D. M.
LAVOLAIN
Gray Porcelain Co.
LAYTEX
U. S. Rubber Co.,
LAZY-X
Radiart Corp.
L-C CHECKER
Aerovox Corp.
LEAK
British Industries Corp.
LEARADIO
Lear, Inc.
LEARAVIAN
Lear, Inc.
LEARMATIC
Lear, Inc.
LEATHAFLEX
Paisley Products, Inc.
LECTURN
J. M. Loge Sound Engineers
LECTROVISION
Transvision, Inc.
LEDEX
Leland, Inc., H.
LEESONA
Universal Winding Co.
L-F
Leibel-Flarsheim Co.
LEKTRO
Conn Ltd., C. G.
LE-LAND
Leland Electric Co.
LEROY
Keuffel & Esser Co.
LEVEL
White Rodgers Elec. Co.
LEXEL
Dobeckmun Co., The
LIBERTY
American Communications Corp.
"LH"
Micro Switch Div.
LIFE-LIKE
Arc Radio Corp.
LIFE-LINE
Westinghouse Electric Corp.
LIFE-SAVER
Cole Radio Works
LIFETIME
Reynolds Metals Co.
LIGHT WATCHMAN
Ripley Co., Inc.
LIGHTNING BUG
Vibroplex Co., Inc.
LIGNOTITE
Paisley Products, Inc.
LIGNOTOX
Paisley Products, Inc.
LIMITROL
Wheelco Instruments Co.
LIMITRON
Arma Corp.
LIN-DE
Linde Air Products Co.
Unit of Union Carbide & Carbon Corp.
LINDOX
Linde Air Products Co.
Unit of Union Carbide & Carbon Corp.
LINE STARTER
Westinghouse Electric Corp.
LINE-O-LITE
Carter Motor Co.
LITE-GAGE
Photocon Research Products
LITE-O-STAT
Viewlex, Inc.
LITTLE DEVIL
Ohmite Mfg. Co.
LITTLEFONE
Doolittle Radio, Inc.
LITTLE GIANT
Crucible Steel Co. of America
LOABOND
Catalin Corp. of America
LOAD CARRIERS
Market Forge Co.
LOAD LIFT
Market Forge Co.
LOAD-MOBILE
Market Forge Co.
LOAD MOVERS
Market Forge Co.
LOAD PAC
Market Forge Co.
LOAD SKIDS
Market Forge Co.
LOAD-VEYOR
Market Forge Co.
LOALIN
Catalin Corp. of America
LOCALITIES
Fostoria Pressed Steel Corp.
LOCKETITE
Locke Incorporated
LOCKSEAM
Superior Tube Co.
LOCK-TITE
Continental Screw Co.
LOCK-TITE
Thomas & Betts Co., Inc.
LOGATEN
Kalbfell Labs., Inc.
LOGE LECTERN
Loge Sound Engineers, J. M.
LOGGER
Audio Instrument Co.
LOHM
Driver-Harris Co.
LOMU
Magnetic Metals Co.
LOOPOHM
Ward Leonard Electric Co.
L'TATRO
Eckstein Radio & Television Co.
LUCERO
Driver-Harris Co.
LUCITE
E. I. du Pont de Nemours & Co., Inc.
LUG-CLIP
Littelfuse, Inc.
LUKENWELD
Lukens Steel Co.
LUMAPANE
Celanese Corp. of America
LUMARITH
Celanese Corp. of America
LUMETRON
Photovolt Corp.
LUSTERIZED
American Electric Cable Co.
LUSTERLAC
American Electric Cable Co.
LUSTREX
Monsanto Chemical Co.
Plastics Div.
LUSTROM
Monsanto Chemical Co.
Plastics Div.
LUXATHERM
Branston Electric Mfg. Co.
LUXIFLUX
Special Chemicals Co.
LUXOMETER
Electronic Mechanical Products Co.
LUXTAR
Viewlex, Inc.
LUXTRON
Bradley Labs., Inc.
LYNN
Vaco Products Co.
LYRIC
Rauland-Borg Corp.
LYT-L-TUNER
S. M. A. Co.
MAESTRO
Reeves Soundcraft Corp.
MAFORCO
Market Forge Co.
MAGIC DOOR
Stanley Works, The
MAGICORE
Crowley & Co., Inc., Henry L.
MAGICTONE
Radio Development & Research Co.
MAGIC WAND
Ward Products Corp. Div. of The Gabriel Co.
MAGMOTOR
Carter Motor Co.
MAGNAC
Magnetic Devices, Inc.
MAGNATELE
Electro Engineering & Mfg. Co.
MAGNATONE
Magna Electronics Co.
MAGNECORDER
Magnecord, Inc.
MAGNEMATIC
Amplifier Corp. of America
MAGNEMUSE
Amplifier Corp. of America
MAGNERAMA
Amplifier Corp. of America
MAGNERASER
Amplifier Corp. of America
MAGNERIBBON
Amplifier Corp. of America
MAGNESCOPE
Amplifier Corp. of America
MAGNESONIC
Sound Recorder and Reproducer Corp.
MAGNESYN
Eclipse-Pioneer Div.
Bendix Aviation Corp.
MAGNETAPE
Amplifier Corp. of America
MAGNETONE
Brush Development Company, The
MAGNETRONIC
Cook Electric Co.
MAGNETTE
Heinemann Electric Co.
MAGNETWIN
Amplifier Corp. of America
MAGNILASTIC
Cook Electric Co.
MAGNISET
Bristol Co., The
MAGNO
Driver-Harris Co.
MAGNORITE
Norton Co.
MAIL-A-VOICE
Brush Development Co.
MALTESE
Bache & Co., Semon
MARFORCO
Market Forge Co.
MARINERS PATHFINDER
Raytheon Mfg. Co.
MARK-TIME
Rhodes Inc., M. H.
MARR
Rattan Mfg. Co., The
MASCO
Simpson Mfg. Co., Inc., Mark
MASTERLOUIT
Kellogg Switchboard & Supply Co.
MASTERPHONE
Kellogg Switchboard & Supply Co.
MASTERPRO
Rek-O-Kut Co.
MATSURF
Arkwright Finishing Co.
MAXIMAR
General Electric X-Ray Corp.
MAXMIXER
Special Products Co.
MAXISCOPE
General Electric X-Ray Corp.
M. B. C.
Ray-O-Vac Co.
MCA
Molding Corp. of America
MEASURAY
Sheffield Corp.
MEASURTEST
Marconi Instruments Ltd.
MECHANI-SEAL
Fafnir Bearing Co.
MEDIQUARTZ
Dallons Labs.
MEDISINE
Dallons Labs.
MEDITHERM
Dallons Labs.
MEFCO
Production Engrg. Co.
MEG-METER
Winslow Co., Inc., The

MEGA-MARKER
Kay Electric Co.
MEGA-MATCH
Kay Electric Co.
MEGA-NODE
Kay Electric Co.
MEGA-PIPPER
Kay Electric Co.
MEGA-PIX
Kay Electric Co.
MEGA-PULSER
Kay Electric Co.
MEGASTYRENE
Trancoa-lin Ltd.
MEGA-SWEEP
Kay Electric Co.
MEGALIGNER
Kay Electric Co.
MEGALYZER
Kay Electric Co.
MEGALYZER JR.
Kay Electric Co.
MEGATENNA
Kay Electric Co.
MEGAVAC
General Scientific Co.
MEGA-X
Kay Electric Co.
MEGGER
Biddle Co., James G.
MEGOHMER
Stutz Co., Inc., Herman H.
MEG-O-MAX
Sprague Electric Co.
MEGOTONE
Arvin Industries
MEISSNER
Maguire Industries
MELMAC
American Cyanamid Co., Plastic Div.
MELODISC
Stone Recording Products Corp.
MELPAK
Melpar, Inc.
MEMCO
Maryland Electronic Mfg. Corp.
MEMOBELT
Dictaphone Corp.
MERCTRON
Sloan Electronics Corp.
MERCU-TROL
Mack Electrical Devices, Inc.
MERCURY
Kinzie Lab.
MERCURY
Vickers Electric Co.
MERCURYSTAT
Westinghouse Electric Corp.
MERITONE
Automat Radio Co.
MERITONE
American Lautsicher Corp.
MERITUNE
Fluxtrol Devices, Inc.
MEROLA
Crosley Corp.
MERRYMAKER
Crosley Corp.
METAL MIKE
Sperry Gyroscope Co.
Div. of the Sperry Corp.
METAL SHIELDED WIRE
Columbia Tubes
METALASTIC
Cook Electric Co.
METALITE
Ashton Corp.
METALIX
North American Philips Co., Inc.
METALSEAL
Rotor Development Company, The
METAMETER
Bristol Co., The
METAPHONE
Bristol Co., The
METAVANE
Bristol Co., The
METCLAD
G-E Circuit Breaker Dept.
METERMAX
Leeds & Northrup Co.
METEROL
Automatic Temperature Controls Co.
METEX
Metal Textile Corp.
METL CAN
Sprague Electric Co.
MET-L-FLEX
Robinson Aviation, Inc.
METRO-LITE
Videotex, Inc.
METRONOMA
Crystal Research Labs., Inc.
METROSCOPE
Photovolt Research Products
METROTHERM
General Controls Co.
MIC
Micalex Insulation Co.
Aircraft Control Div.
MICABOND
Continental Diamond Fibre Co.
MICA-GLAS
National Electric Coil Co.
MICANITE
Mica Insulator Co.
MICARTA
Westinghouse Electric Corp.
MICO
Mica Insulator Co.
MICRO
New Hampshire Ball Bearings
MICROACT
Bristol Co., The
MICRODISC
Wagner Recorder Mfg. Corp.
MICRODRILL
Televisionics Laboratory, Inc.
MICRODYNE
Audak Co.
MICROFLASH
General Radio Co.
MICROFLEX
Eagle Signal Corp.
MICROLINE
Sperry Gyroscope Co.
MICRO-MATCH
Jones Electronics Co., M. C.
MICROMAX
Leeds & Northrup Co.
MICRO-MIKER
Kaibfell Labs., Inc.
MICROMOTORS
Redmond Co., Inc.
MICROPOSITIONER
Barber-Colman Co.
MICRO-POT
Gibbs Div.
George W. Borg Corp.
MICRO-PULSER
Kay Electric Co.
MICROSEN
Manning, Maxwell & Moore, Inc.
MICROSIL
Magnetic Metals Co.
MICROTHERM
Barber-Colman Co.
MICROTHERM
Raytheon Mfg. Co.
MICROTORQUE
Giannini & Co., Inc.
MICRO-TROLLER
Westinghouse Electric Corp.
MICROVAC
Stokes Machine Co., F. J.
MICROVOLTER
Fenwal Instrument Co.
MICRO WEAVE
Holliston Mills Inc., The
MIDGET
Sprague Electric Co.
MIDGETROL
P. R. Mallory & Co., Inc.
MIDOHM
Brown-Harris Co.
MIDWAY
Cardwell Mfg. Corp., Allen D.
MIGHTY MIDGET
Sperman Metal Specialties
MIJAKON
East & Co., John E.
MIKASUB
East & Co., John E.
MIKE
Connell Dubilier Electric Corp.
MILCO
Miller Mfg. Co., M. A.
MILLISEC RELAY
Stevens-Arnold, Inc.
MINALITE
Westinghouse Electric Corp.
MINATROL
Westinghouse Electric Corp.
MINERALIGHT
Ultra Violet Products, Inc.
MINIGRAPH
Westinghouse Electric Corp.
MINI-AMP
Industrial Devices, Inc.
MINI MAX
National Carbon Division
Union Carbide & Carbon Corp.
MINISCALER
Atomic Instrument Co.
MINI-SHIELD
Storm Co., Inc.
MINI-SIGNAL
Precision Crystal Labs., Inc.
MINI-SPRING
Storm Co., Inc.
MINITAPE
Stancil-Hoffman Corp.
MINI-VOLT
Industrial Devices, Inc.
MINSTREL
Crosley Corp.
MINSUA
Moffat & Elder Co.
MINUTE MAN
Ward Products Corp.
Div. of The Gabriel Co.
MIRACLE POINT
Gerrett Corp., M. A.
MIRROR TONE
Meck Industries, John
M. L. S.
Kenney Products Inc.
MODIFIED HILO
Silver Co., Wilbur B.
MODUFLOW
Minneapolis-Honeywell Regulator Co.
MODULITE
Bendix Aviation Corp.
MODU-WAVE
Sciaky Bros., Inc.
MOLDARTA
Westinghouse Electric Corp.
MOLDITE
National Moldite Co.
MOLDLOCK
American Brass Co.
MOLDTEX
Racon Electric Co.
MOLD-TITE
United Condenser Corp.
MOLECULE SQUEEZER
Rubinette Co., W. C.
MONEL
The International Nickel Co., Inc.
MONISEAL
Magnetic Metals Co.
MONISEAL "444"
Carpenter Steel Co.
MON-KEY
Electric Eye Equipment Co.
MONOBLOCK
Winchester Electronics Co.
MONOCOIL
Elliott Mfg. Co.
MONOBAR
Tibbetts Industries, Inc.
MONODRUM
Gurrels & Gurrell
MONOMOTORS
Redmond Co., Inc.
MONO-PAC
Beltone Hearing Aid Co.
MONOPHONE
Automatic Electric Co.
MONOPLEX
Shure Brothers, Inc.
MONOSET
Bristol Co., The
MONOSET
Telex, Inc.
MONOTUBE
Tuttle & Kift
MONTE CARLO
Televista Corp. of America
MOODY-KIT
Phonograph Needle Mfg. Co., Inc.
MORTEX
Moore Co., Howard J.
MOTO-MITE
Globe Industries
MOTORLITE
Ward Leonard Electric Co.
MOTOR WATCHMAN
Westinghouse Electric Corp.
MOT-O-TROL
Westinghouse Electric Corp.
MOTRON
Rubinette Co., W. C.
MPB
Miniature Precision Bearings, Inc.
M-SCOPE
Fisher Research Lab.
NUCHROHM
Magnetic Metals Co.
MUL-TEL
Brach Mfg. Corp.
MUL-TV
General Electronics Corp.
MULTI-ANALYST
Electronic Instrument Co., Inc.
MULTIBREAKER
Square D Co.
MULTICARDIOTRON
Electro-Physical Labs.
MULTICORE
British Industries Corp.
MULTICOUNTER
Atomic Instrument Co.
MULTICOUPLER
Amy, Aceves & King, Inc.
MULTIFAX
Western Union Telegraph Co.
MULTIFLEX
Eagle Signal Corp.
MULTI-LOW-RANGE
Dillon & Co., Inc., W. C.
MULTI-MASTER
Precision Apparatus Co.
MULTIMET
Haynes Stellite Co.
Unit of Union Carbide & Carbon Corp.
MULTIMETER
Kaufman Electrical Instrument Co.
MULTIPLANE
Lucas Mfg. Co.
MULTIPLE SHOT
Kirk Molding Corp.
MULTIPOT
Kiva Engineering Co.
MULTIPOWER
E. A. Myers & Sons
MULTI-RECTIFIER
Universal Electric Co., Inc.
MULTISCALER
Atomic Instrument Co.
MULTISCOPE
Arma Telectronix Div.
NEA Service Inc.
MULTI-SWAGE PROCESS
Reed Chain Mfg. Co., The
MULTITROL
Ward Leonard Electric Co.
MULTIVIDEO
Industrial Television, Inc.
MULTIVISION
Industrial Television, Inc.

MULTIVISION SCREEN
House of Television, Inc.
MULTIVOLT
Ohmite Mfg. Co.
MUSICON
Lekas Mfg. Co.
MUSIKING
Symphony Radio & Television Corp.
MYCALEX 400
Mycalex Corp. of America
MYCALEX 410
Mycalex Corp. of America
MYCALEX K
Mycalex Corp. of America
MYKAPLAST
United Condenser Corp.
MYKROY
Electronic Mechanics, Inc.
MYSTAPHONE
Taybern Equipment Co.
MYSTERY
Taybern Equipment Co.
MYVACENE-S
Distillation Products Industries
MYVAWAX-S
Distillation Products Industries
999 "PLUS"
Handy & Harman
NA-ALD
Alden Products Co.
NALCO
National Lead Co.
NALCO
North American Electric Lamp Co.
NAMCO
National Acme Co.
NASAT
Westinghouse Electric Corp.
NATIONAL
Valco Mfg. Co.
NATVAR
National Varnished Products Corp.
NAUGAHYDE
U. S. Rubber Co.
NEILLITE
Watertown Mfg. Co.
NEMCO
National Electronic Mfg. Co.
N. E. M. S.
National Electrical Machine Shops, Inc.
NEOLAY
U. S. Rubber Co.
NE-O-LITE
General Cement Mfg. Co.
NEPEC
Centralab Div.
Globe Union Inc.
NEUTRASEAL
Cook Electric Co.
NEVERSLIP
Philadelphia Steel & Wire Co.
NEYDIUM
Ney Co., J. M.
NEY-ORO
Ney Co., J. M.
NICAD
Nickel Cadmium Battery Corp.
NICHROME
Driver-Harris Co.
NILSTAIN
Driver Co., Wilbur B.
NILVAR
Driver-Harris Co.
NIREX
Driver-Harris Co.
NITE-T-LITE
Littelfuse, Inc.
NITRON
Monsanto Chemical Co.
Plastics Div.
NOARK
Federal Electric Products Co.
NOBATRON
Sorensen & Co., Inc.
NOBLELOY
Continental Carbon, Inc.
NOFLAME-COR
Dornish Wire Co.
NO FOME
L. & P. Mfg. Co.
NOISERASER
Minneapolis Electronics Corp.
NOKORODE
Dunton Co., D. W., The
NOMU
Magnetic Metals Co.
NON-LINK
Positive Lock Washer Co.
NO-OX
Walter L. Schott Co.
NORBIDE
Norton Co.
NORELCO
North American Philips Co., Inc.
NORLOC
Norris Labs., Inc.
NORTHEAST
Delco Appliance Div.
General Motors Corp.
NTC
Keystone Carbon Co., Inc.
N. U.
National Union Radio Corp.
NU-BLAC
Star Porcelain Co.
NUCAMITE
National Union Radio Corp.
NUCLEOMETER
Radiation Counter Laboratories, Inc.
NUKEMITE
Nukem Products Corp.
NU PAMITE
National Union Radio Corp.
NWL
Nothelfer Winding Labs.
NYLOK
Production Engrg. Co.
NYLON
du Pont de Nemours & Co., Inc., E. I.
NYLONITE
Plastic Wire & Cable Corp.
NYLON-ZIP
Waldes Kohinoor Inc.
OAKWOOD
Osborn Products
OCTOIL-S
Distillation Products Industries
OHIOHM
Ohio Carbon Co.
OHMAX
Driver-Harris Co.
OHMOID
Wilmington Fibre Specialty Co.
OHM-SPUN
Ohmite Co.
OILDAG
Acheson Colloids Corp.
OILITE
Amplex Division
Chrysler Corp.
OKOBESTOS
Okonite Co.
OKOGLASS
Okonite Co.
OKOLENE
Okonite Co.
OKOLITE
Okonite Co.
OKOPRENE
Okonite Co.
OKOSEAL
Okonite Co.
1000 SPAR
Standard Varnish Works
OPTIMATIC
Minneapolis-Honeywell Regulator Co.
OPTIMIKE
Instrument Development Laboratories, Inc.
OPTO-MATIC
Tyco Fuse Mfg. Co.
ORACO
Oak Ridge Antennas Div. of
Video Television Inc.
ORIENTER
Lear, Inc.
ORTHOCHROM
Rohm & Haas Co.
ORTHOLITE
Rohm & Haas Co.
ORTHOSONIC
Electronic Labs., Inc.
OSAGE
Linick Chemical Co.
OSISO
Westinghouse Electric Corp.
OSCILLO-RECORD
Fairchild Camera & Instrument Corp.
OSSCO
Omaha Scientific Supply Co.
OUNCER
United Transformer Corp.
OXYHEMOGRAPH
Photocon Research Products
OXWELD
Linde Air Products Co.
Unit of Union Carbide & Carbon Corp.
OZALID
General Aniline & Film Corp., Ozalid Div.
PAISOL
Paisley Products, Inc.
PAISTEX
Paisley Products, Inc.
PAISTIC
Paisley Products, Inc.
PAISTICK
Paisley Products, Inc.
PALINEY
Ney Co., J. M.
PAL
Palnut Co., Inc.
PAMARCO
Paper Machinery & Research, Inc.
PANADAPTOR
Panoramic Radio Products, Inc.
PANALYZOR
Panoramic Radio Products, Inc.
PANDEX
Westinghouse Electric Corp.
PANELTONE
Answey Radio Corp.
PANELYTE
St. Regis Paper Co., Panelyte Div.
PANORAMOSCOPE
Panoramic Radio Products, Inc.
PANTO
Press Engraving Machine Co.
PANT-O-JECTOR
Engineers Specialties Div.
Universal Engraving & Coloreplate Co.
PANT-O-SCRIBER
Engineers Specialties Div. Universal Engraving & Coloreplate Co.
PAPERITE
Acme Wire Co.
PARACORE
U. S. Rubber Co.
PARA-FLUX
Radio Music Corp.
PARAGON
Keuffel & Esser Co.
PARAPLEX
Rohm & Haas Co.
PARCO LUBRITE
Parker Rust Proof Co.
PARISIANOID
Parisian Novelty Co.
PASSMOUR
Pass & Seymour, Inc.
PATHFINDER
Submarine Signal Div.,
Raytheon Mfg. Co.
PATTERSON LUMINESCENT
du Pont de Nemours & Co., Inc., E. I.
P. E. C.
Centralab Div.
Globe Union Inc.
P. E. C.
Precision Electronic Components Reg'd.
PECO
Pacific Electricord Co.
PEE-WEE
Mueller Electric Co.
PEERLESS
Altec Lansing Corp.
PEERLESS
National Vulcanized Fibre Co.
PEL-X
Hollston Mills, Inc., The
PEM
Penn Engineering & Mfg. Corp.
PENACOLITE
Koppers Co., Inc.
PERFECT-O-CUT
Tablet & Ticket Co.
PERKINS
Westinghouse Electric Corp.
PERMACEL
Industrial Tape Corp.
PERMACELL
U. S. Rubber Co.
PERMADINE
American Chemical Paint Co.
PERMAKAY
Motorola, Inc.
PERMALITIES
Universal Microphone Co.
PERMALLOY
Arnold Engineering Co.
PERMANITE
Foote Mineral Co.
PERMANITE
I.T.E. Circuit Breaker Co.
PERMA-POWER
General Transformer Corp.
PERMAZINC
Locke Incorporated
PERMENDUR
Arnold Engineering Co.
PERMENORM
Arnold Engineering Co.
PHANO
Dixon Crucible Co., Joseph
PHAOSTRON
Stoble Engineering & Mfg. Co.
PHASEFORMER
Eastern Specialty Co.
PHENOCOTE
Watt Co.
PHENOFLEX
Dielectric Materials Co.
PHENOL FIBRE
Taylor Fibre Co.
PHENOLITE
National Vulcanized Fibre Co.
PHILHARMONIC
Essex Mfg. Co., Inc.
PHIL-TROL
Phillips Control Corp.
PHONOPHRAGMS
Magnetic Metals Co.
PHOS-COPPER
Westinghouse Electric Corp.
PHOTACT
Keuffel & Esser Co.
PHOTELOMETER
Central Scientific Co.
PHOTO-ARC
Peerless Photo Products
PHOTOLUX
Westinghouse Electric Corp.
PHOTOPHONE
Radio Corporation of America
PHOTO-TROLLER
Westinghouse Electric Corp.
PHOTOTRONIC
Weston Electrical Instrument Corp.
PHOTOX
Westinghouse Electric Corp.
PHOTRONIC
Weston Electrical Instrument Co.
PICTURE-PERFECT
Louis Bros.
PIEZO-RAY
Commercial Research Labs., Inc.
PILOTONE
Pilot Radio Corp.
PILOTROL
Bailey Meter Co.
PINCOR
Pioneer Gen-E-Motor Corp.

P-K
Parker Rotary Corp.
PLASKON ALKYD
Plaskon Div., Libbey-Owens-Ford Glass Co.
PLAST-CORIRON
Plastics Metals Division
The National Radiator Co.
PLASTACELE
du Pont de Nemours & Co., Inc., E. I.
PLASTICLEAN
House of Television
PLASTICON
Plastic Wire & Cable Corp.
PLASTI-GRIP
Aircraft Marine Products, Inc.
PLASTIMOLD
Emerson Radio & Phonograph Corp.
PLAST-IRON
Plastics Metals Division
National Radiator Co., The
PLASTITE
Whitney Blake Co.
PLAST-MAGNETITE
Plastic Metals Division
National Radiator Co., The
PLAST-MANGANESE
Plastic Metals Division
National Radiator Co., The
PLAST-NICKEL
Plastic Metals Division
National Radiator Co., The
PLAST-O-DIP
Aerovox Corp.
PLASTOK
Richardson Co.
PLASTO PAK
Standard Varnish Works
PLAST-SILICON
Plastic Metals Division
National Radiator Co., The
PLAST-SPONGE
Plastic Metals Division
National Radiator Co., The
PLAST-STEEL
Plastic Metals Division
National Radiator Co., The
PLATO
Raytheon Mfg. Co.
PLAX PAK
A-Pax Corp.
PLAYBACK
Revere Sound-craft Corp.
PLAYBOY
Carbonneau Industries, Inc.
PLAYBOY
Crosley Corp.
PLAYSALL
Carbonneau Industries, Inc.
PLAYTIME
Crosley Corp.
PLENTI-POWER
Westinghouse Electric Corp.
PLEXENE
Hilton & Hash Co.
PLEXICON
E. I. du Pont de Nemours & Co.
PLEXIGLAS
Hilton & Hash Co.
PLIABOOK
P. Lorillard Co.
PLIABLE
Paisley Products, Inc.
PLIABLE
Paisley Products, Inc.
PLIABOND
Goodyear Tire & Rubber Co.
PLIOGRIP
Goodyear Tire & Rubber Co.
PLIOLITE
Goodyear Tire & Rubber Co.
PLIOTHERM
Goodyear Tire & Rubber Co.
PLIO-TUF
Goodyear Tire & Rubber Co.
PLIOVIC
Goodyear Tire & Rubber Co.
PLYA-SEAL
Fafnir Bearing Co.
PLYMOUTH
Mica Industries, Inc.
PLYOPHEN
Reichhold Chemicals, Inc.
PN
Rauh Development Co.
POCKETSCOPE
Waterman Products Co., Inc.
POLAROID
Polaroid Scientific Corp.
POLATENNA
Fischer-Farnsworth Corp.
POLATRON
Fischer-Farnsworth Corp.
POLECTRON
General Aniline & Film Corp.
POLICARB
Dryer Co., Wilbur B.
POLIMERATOR
Short Wave Plastic Forming Co.
POLINEAR RECORDER
Sound Apparatus Co.
POLYCO
Polymer Corp., The
POLYFLEX
Plax Corp.
POLYMET
Cosmic Radio Corp.
POLY-PENDANCE
Standard Transformer Corp.
POLYPHONIC SOUND
American Broadcast Equipment Corp.
POLY PLASTIC
Standard Varnish Works
POLYRANGER
Sensitive Research Instrument Corp.
POLYTHENE
du Pont de Nemours & Co., Inc., E. I.
POLYTHERM
Dielectric Materials Co.
POLY-VISO
Cathode Co.
POLYWELD
American Phenolic Corp.
PORTA-FLEXER
Mosaic Infra Red Co.
PORTA-POWER
General Transformer Corp.
PORTAPOWER
Electronic Corp., The
PORTENTIOTROLS
American Instrument Co.
PORT-O-REEL
Industrial Electrical Works
PORTRONIC
Photographic Products, Inc.
POTENTIOTIALS
Weston Instruments Div.
POST-LITE
Sightlite, Inc.
POWDERMET
Powdered Metal Products Corp.
POWDIRON
Round Brook Ball Less Bearing Co.
POWER BOOSTER
McGraw-Electric Corp.
POWEREEL
Industrial Electrical Works
POWER-FLEX
Flex-o-Tube Co.
POWER STREAK
American Electric Cable Co.
POWER VOICE
Tatham Equipment Co.
POWERSTAT
Superior Electric Co.
POWMINCO
Powhatan Mining Co.
POWRMIKE
Operating Loudspeakers, Inc.
PRECEPTRON
Goodrich Corp.
PRECIPITRON
Westinghouse Electric Corp.
PRECISIONAIRE
Sheffield Corp.
PRECISIONER
Masterite Co.
PRECISION-GAUGED
Precision Products Co.
PREGWOOD
Panelyte Division
PREMIER-TONE
Premier Metal Etching Co.
PRESET
Bristol Co., The
PRESSOVAC
Central Scientific Co.
PreSURE
Precision Electrical Products Corp.
PRESSUREGRAPH
Electric Products Labs., Inc.
PRESTEEL
Worcester Pressed Steel Co.
PRESTITE
Westinghouse Electric Corp.
PREST-O-LITE
Linde Air Products Co.
Unit of Union Carbide & Carbon Corp.
PREST-O-WELD
Linde Air Products Co.
Unit of Union Carbide & Carbon Corp.
PRESSWOOD
Mayolite Corp.
PRESTROL
Gerard Corp., W. A.
PRIVATE EYE
Radionic Devices Corp.
PRMCO
Premier Mfg. Co.
PRODELIN
Product Development Co., Inc.
PROGAR
Lingevin Co., Inc.
PROKAR
Prokar Electric Co.
PROJECTALL
Tower Television Productions, Inc.
PROMATIC
General Control Company
PROMCO
Progressive Mfg. Co.
PROPELLAIR
Robbins & Myers, Inc.
PROTECTOCLO
Minneapolis-Honeywell Regulator Co.
PROTECTORS-XX
Minneapolis-Honeywell Regulator Co.
PROTECTRON
Bicknell Company, The
PROTELGRAM
North American Philips Co., Inc.
PROVAC
Electronic Designs, Inc.
PRYSTAL
Catalin Corp. of America
P. S.
Motorola, Inc.
P & S
Pass & Seymour, Inc.
PURATONE
Brach Mfg. Corp.
PUREBON
Pure Carbon Co.
PURIFIL
Electric Eye Equipment Co.
PUROX
Linde Air Products Co.
Unit of Union Carbide & Carbon Corp.
PWC
Plastic Wire & Cable Corp.
PYGMY
Arnold Electric Co.
PYRALIN
du Pont de Nemours & Co., Inc., E. I.
PYREX
Corning Glass Works
PYROCON
Pyrotenax Testing Labs., Inc.
PYRODYN
Skydyne, Inc.
PYROLANCE
Pyrotenax Testing Labs., Inc.
PYROMASTER
Bristol Co., The
PYROMATIC
Arlington Electronics Components, Inc.
PYROTESTER
Kapco Test Equipment Co.
PYROTRON
Bailey Meter Co.
PYROVAC
Eitel-McCullough, Inc.
Q-LACE
Guthman Inc., Edwin J.
Q-MAX
Communication Products Co., Inc.
QUAD-EX
Tenex, Inc.
QUADREX
Westinghouse Electric Corp.
QUADRILINE
Radio Engineering Labs., Inc.
QUADROCONDEX
Westinghouse Electric Corp.
QUANTOMETERS
Applied Research Laboratories
QUARTZ Q
Miller Mfg. Div., James
QUELARC
[illegible] National Co.
QUICKLAG
Westinghouse Electric Corp.
QUICK-LOCK
Cinemart Kattenier Corp.
QUIETONE
Garrett-Callahan Electric Corp.
QUIK-CALL
Motorola, Inc.
QUIK-LABELS
Brady Co., W. H.
QUIK-SHOT
Kennedy Mfg. Co.
QUINORGO
Johns-Manville Sales Corp.
QUINTERRA
Johns-Manville Sales Corp.
"R" MONEL
International Nickel Co., Inc., The
RACON BROADBAND
Racon Electric Co.
RAD-A-COR
Magnetic Core Corp.
RADAIR
Bassett Inc., Rex
RADALARM
Communications Co., Inc.
RADAMETER
Raytheon Mfg. Co.
RADARANGE
Raytheon Mfg. Co.
RADELIN
Radelin Radium Corp.
RADEX
Boston Insulated Wire & Cable Co.
RADIOCARB A
Dryer Co., Wilbur B.
RADIOEAR
Myers & Sons, F. A.
RADIO INDUCTOGRAPH
Inductograph Lab.
RADIOHM
Dryer-Harris Co.
RADIOHM
Centralab Div.
Globe-Union, Inc.
RADIOLA
Radio Corp. of America
RADIOMARINE
Radio Corp. of America
RADIO-PILOT
Fisher Research Lab.
RADIOSURG
Electronic Equipment & Instrument Co.
RADIOTHERM
Westinghouse Electric Corp.
RADIOTRON
Radio Corp. of America
RAD-O-RECORDER
Masarc, Inc.

RADOT
Press Wireless Mfg. Co., Inc.
RAILITE
Amplex Div.
Chrysler Corp.
RAKSCOPE
Waterman Products Co., Inc.
RANCOSTAT
Ranco, Inc.
RANGE LUGS
Frankel Connector Co.
RANGE MASTER
Bradshaw Instruments Co.
RANGER
Electronic Specialty Co.
RANGER
J. F. D. Mfg. Co.
RANGER
Westinghouse Electric Corp.
RANGERECORD
Rangertone, Inc.
RANGERECORDER
Rangertone, Inc.
RANGESPLICES
Frankel Connector Co.
RANGETAPS
Frankel Connector Co.
RATOSIGHTS
Fisher & Porter Co.
RATOSLEEVES
Fisher & Porter Co.
RATOTRONIC
Fisher & Porter Co.
RAYCHRONIX
Radioactive Products, Inc.
RAYCHRONOMETER
Radioactive Products, Inc.
RAY-DEC
Frederic Flader, Inc.
RAYDIST
Hastings Instrument Co.
RAYFUSER
Radioactive Products, Inc.
RAYMERSION
Trumbull Electric Mfg. Co.
RAYOFLEX
Schott Co., Walter L.
RAYONIC
Waterman Products Co., Inc.
RAYSONDE
Foley Instrument Div.
Bendix Aviation Corp.
RAYPHOTO
Times Facsimile Corp.
RAYTHEON-BELMONT
Belmont Radio Co., Div. Raytheon Mfg. Co.
RAYTHERM
Raytheon Mfg. Co.
RAY-X
Raytheon Mfg. Co.
R B & W
Russell, Burdsall & Ward Bolt and Nut Co.
R C
Radio Condenser Co.
RCA
Radio Corp. of America
RCA VICTOR
Radio Corp. of America
REACTRON
United Condenser Corp.
READO
Crosley Corp.
RECEPTRON
Howard Mfg. Corp.
RE-CIRK-IT
Heintzmann Electric Co.
RECO
Rectifier Engineering Co.
RECO
Reynolds Electric Co.
RECORDALL
Mirro Reproducer Co., Inc.
RECORDIO
Wilcox-Gay Corp.
RECORDION
Wilcox-Gay Corp.
RECORDIOPOINT
Wilcox-Gay Corp.
RECORDISES
Recordisc Corp.
RECORDO
Wilcox-Gay Corp.
RE-CORD-O-FONE
Bell Sound Systems, Inc.
RECTICHARGER
Raytheon Mfg. Co.
RECTIFILTER
Raytheon Mfg. Co.
RECTIGON
Westinghouse Electric Corp.
RECTOMATIC
Westinghouse Electric Corp.
RECTOPLATER
Mallory & Co., Inc., P. R.
RECTOSTARTER
McColpin-Christie Corp.
RECTOX
Westinghouse Electric Corp.
RECTROL
Electro-Tech Equipment Co.
REDFLASH
Vaco Products Co.
RED HEAD
Ideal Corp.
Therm-ex Div.
RED LETTER
Ruby Chemical Co.
RED SEAL
Radio Corporation of America
RED STREAK
Brown Bridge Mills, Inc.
REFLECTAR
Black Video Corp., F. G.
REFRACTALOY
Westinghouse Electric Corp.
REGOHM
Electric Regulator Corp.
REGULITE
Ward Leonard Electric Co.
REKORDER
Gorrell & Gorrell
REL
Radio Engineering Labs., Inc.
RELATROL
Automatic Temperature Control Co.
RELAYMATIC
Kellogg Switchboard & Supply Co.
RELIO
U. S. Rubber Co.
REMACO
Clarkstan Corp.
REMALLOY
Arnold Engineering Co.
REMBRANDT
Remington Radio Corp.
REMOTE-O-CABLE
J. F. D. Mfg. Co.
REN
Nebel Lab., R. E.
REPEATER
Kemlite Labs.
RESIGUM
Paisley Products Inc.
RESIMENE
Monsanto Chemical Co.
Plastics Div.
RESIN-FIVE
Kester Solder Co.
RESINITE
Precision Paper Tube Co.
RESINOX
Monsanto Chemical Co.
Plastics Div.
RESI-RAP
Paisley Products Inc.
RESISTOL
Collyer Insulated Wire Co.
RETRAX
Accometer Div. of Roanwell Corp.
REVERSIT
Rattan Mfg. Co., The
REX
Crucible Steel Co. of America
REX
Stone Brothers, Inc.
REXFLEX
Chicago Metal Hose Corp.
REXON
Hamilton Kent Mfg. Co., Inc.
REXTUBE
Chicago Metal Hose Corp.
REXVANE
Westinghouse Electric Corp.
REXWELD
Chicago Metal Hose Corp.
REZISTAL
Crucible Steel Co. of America
RHINOBESTOS
Westinghouse Electric Corp.
RHOMAX
Magnetic Metals Co.
RHOMU
Magnetic Metals Co.
RHONITE
Rohm & Haas Co.
RIB FLEX
Ward Leonard Electric Co.
RIBOHM
Ward Leonard Electric Co.
RICHELAIN
Richardson Co.
RIGFAST
Oak Ridge Products Mfg. Div. of Video Television, Inc.
RINKOLIN
Standard Varnish Works
R. I. P.
Westinghouse Electric Corp.
RITEOHM
Ohmite Mfg. Co.
R & M
Robbins & Myers, Inc.
R M B
Landis & Gyr, Inc.
RME
Radio Mfg. Engineers, Inc.
ROBOLITES
Universal Microphone Co.
ROBOTROL
Reliance Automatic Lighting Co.
ROGER
Accometer Div. of Roanwell Corp.
ROL-TOP
Rieth-Aircraft Nut Corp.
ROLLPINS
Elastic Stop Nut Corp.
ROTABRAKE
Lear, Inc.
ROTALYZER
Kay Electric Co.
ROTA-TOWER
Easy-Up Tower Co.
ROTO-BEAM
Gordon Specialties Co.
ROTO BEAM
Kings Electronics Co.
ROTO-COUNT
Automatic Temperature Control Co., Inc.
ROTO-DISPLAY KING
Gale Dorothea Mechanisms
ROTO FORMER
Westinghouse Electric Corp.
ROTOMATIC
Johnson Co., E. F.
ROTOMOUNT
Premax Products Div.
Chisholm-Ryder, Inc.
ROTOTROL
Westinghouse Electric Corp.
ROTO-VISION
Illinois Wood Products Corp.
RO-TRAN
Rome Cable Corp.
ROYAL
General Lead Batteries Co.
ROYAL
U. S. Rubber Co.
ROYAL CORD
U. S. Rubber Co.
ROYAL GOLD
U. S. Rubber Co.
ROYAL JEWEL
Jensen Industries, Inc.
ROYAL MASTER
U. S. Rubber Co.
ROYALITE
U. S. Rubber Co.
R P C
Resistance Products Co.
R S M C
Radio Specialty Mfg. Co.
R T L
Peirce Wire Recorder Corp.
RUBALT
Hogue & Co., Inc., Alfred
RUBCORD
U. S. Rubber Co.
RUB-EROK
Richardson Co.
RUBSEC
U. S. Rubber Co.
RUB-TEX
Richardson Co.
RUBYFLUID
Ruby Chemical Co.
RUCCO
Ruby Chemical Co.
RUF KOAT
General Cement Mfg. Co.
RUSH
Fraser Co., Inc.
R V
Clarkstan Corp.
RYERTEX
Ryerson & Son, Inc., Joseph T.
SAFE-T-PLUG
Littelfuse Inc.
SAFE-T-SPARKY
Littelfuse Inc.
SAFLEX
Square D Co.
SAFLEX
Monsanto Chemical Co.
SANACOUSTIC
Johns-Manville Sales Corp.
SANFORD-BENNET
Rubicon Co.
SARAN
Dow Chemical Co.
SAUTER TIME SWITCHES
Cramer Co., Inc., R. W.
SAV-A-SHAFT
National Union Radio Corp.
S B
Vaco Products Co.
SCALE-O-MATIC
Technical Associates
SCHENCK
Ferner Co., R. Y.
SCOTCH TAPE
Minnesota Mining & Mfg. Co.
SCOTTIE
Remler Co., Ltd.
SEALDOHM
Daven Co.
SEALEX
General Ceramic & Steatite Corp.
SEALNUT
Radio Frequency Labs., Inc.
SEAL-O-FLANGE
Communication Prods. Co., Inc.
SEALSTIX
Central Scientific Co.
SEAMASTER
Dole & Co., Inc., F. E.
SELECTO-CALL
Federal Telephone & Radio Corp.
SELECT-O-PHONE
Kellogg Switchboard & Supply Co.
SELECTOVISION
Communication Measurements Lab., Inc.
SELECTRO-PLATERS
Green Electric Co., Inc.
SELETRON
Radio Receptor Co.
SELFLUBE
Keystone Carbon Co., Inc.
SEMCO
Stolle Engineering & Mfg. Co.
SEMS
Lemco & Sessions Co.

SENSATHERM
Mercoid Corp.
SENSICON
Motorola, Inc.
SENSITROL
Weston Electrical Instrument Corp.
SENSITRON
Weston Electrical Instrument Corp.
SENTINEL
Photobell Company
SENTINEL
Westinghouse Electric Corp.
SEPIATONE
Frederick Post Co.
SERRASOID
Radio Engineering Labs., Inc.
SERVICE MIKE
Cornell-Dubilier Electric Corp.
SERVOBOARD
Servo Corp. of America
SERVOFLIGHT
Servo Corp. of America
SERVOGRAPH
Fielden Electronics Inc.
SERVOGRAPH
Servo-Tek Products Co.
SERVOSCOPE
Servo Corp. of America
SERVOTHERM
Servo Corp. of America
SERVOTRON
Raytheon Mfg. Co.
SERV-RITE
Gordon Co., Claud S.
SHADOWCONTROL
Autotron Co., The
SHADOWCOUNT
Autotron Co., The
SHADOWMASTER
Autotron Co., The
SHANNON GLOW
Shannon Luminous Materials Co.
SHARP FOCUS TELEVISION
Andrea Radio Corp.
SHELDON
Jackson Industries, Inc.
SHUR GRIP
Parker-Kalon Corp.
SHURITE
J. H. T. Instruments, Inc.
SHURLOCK
Pass & Seymour, Inc.
SIECO
Sherman Industrial Electronics Co.
SIGHT METER
Weston Electrical Instrument Co.
SIGNALINER
Kahle Engineering Co.
SILANEAL
Dow Corning Corp.
SILASTIC
Dow Corning Corp.
SILCAZ
Electro Metallurgical Co.
Unit of Union Carbide & Carbon Corp.
SILENTBLOC
The General Tire & Rubber Co.
Chemical Div.
SILENT SENTINEL
Westinghouse Electric Corp.
SILFLEX
Varflex Corp.
SIL-FOS
Handy & Harman
SILKENITE
Acme Wire Co.
SILVALOY
Linde Air Products Co.
Unit of Union Carbide & Carbon Corp.
SILVERCOTE
Little Falls Alloys, Inc.
SILVERMIKE
Cinaudagraph Corp., of America
SILVER Q
Delmonte, Inc.
SILVERSTAT
Westinghouse Electric Corp.
SILVERTONE
Crystal Radio Corp.
SIMPAC
Westinghouse Electric Corp.
SIMPLEFLEX
Masonite Corp., The
SIMPLETROL
Assembly Products, Inc.
SIXTY
Delany Brothers
SKAN
G. M. Laboratories, Inc.
SKANASCOPE
Scientific Mfg. Co., Inc.
SKL
Spencer-Kennedy Labs., Inc.
SKORESIN
Skoog Corp.
S. K. S.
Stanley Products, Inc.
SKYFONE
Hallicrafters Co.
SKYGUIDE
Philco Corp.
SKY-KING
J. F. D. Mfg. Co.
SKYPLY
Skydyne, Inc.
SKY WEIGHT
Continental Electronics, Ltd.
SLIDEOHM
Aerovox Corp.
SLIPSTICK
Decimeter, Inc.
SLIPSYN
Westinghouse Electric Corp.
SLO-BLO
Littelfuse, Inc.
SMOKGAGE
Gas Instrument Co.
SMUTGATH
Special Chemicals Co.
SMZ
Electro Metallurgical Co.
Unit of Union Carbide & Carbon Corp.
SNAP-LOCK
National Acme Co.
SNAP-LOCK ANTENNA
Oak Ridge Products Mfg. Div. of
Video Television, Inc.
SNIFFER
Nuclear Instrument & Chemical Corp.
SO-HARD
Southington Hardware Mfg. Co.
SOLDALOY
Mallory & Co., Inc., P. R.
SOLDERALL
Beach Mfg. Corp.
SOLDER MASTER
Hexacon Electric Co.
SOLDERLITE
Weller Mfg. Co.
SOLISTRAND
Aircraft-Marine Products, Inc.
SOLOTRON
Midwest Hearing Aids Laboratory, The
SOLU-BRIDGE
Industrial Instruments, Inc.
SONACTOR
Kay Electric Co.
SONA-GRAPH
Kay Electric Co.
SONALATOR
Kay Electric Co.
SONARMETER
Raytheon Mfg. Co.
SONIC EAR
Tuthill Equipment Co.
SONOCLE
Sonotone Corp.
SONODYNE
Snow Brothers, Inc.
SONO-PROBE
Aircraft Electronics Associates, Inc.
SONOWEAR
Sonotone Corp.
SOS
Clevite Co.
SOUNDCASTER
Operadio Mfg. Co.
SOUNDEX
Proctor Sounder Corp.
SOUND CELL
Brush Development Co.
SOUND ISOLATION BLANKET
Owens-Corning Sales Corp.
SOUNDMIRROR
Brush Development Co.
SOUNDTRAP
Miller Reproducer Co., Inc.
SOUNDVIEW
Tech-Master Products Co.
SPARKFLASH
Sprague Mfg. Co.
SPARX
McMurdo Silver Co., Inc.
SPAULDITE
Spaulding Fibre Co., Inc.
SPAULDO
Spaulding Fibre Co., Inc.
SPEAK-EZ
Amplifier, Inc.
SPECO
Precision Chemical Co.
SPECO
Special Products Co.
SPECONAX
Special Chemicals Co.
SPECPLATER
Special Chemicals Co.
SPEC-POWER
National Spectrographic Laboratories, Inc.
SPECTABLE
Special Chemicals Co.
SPECTREIER
Spectro-Chemicals Corp.
SPECTROPHOTELOMETER
Precision Scientific Co.
SPEECH-MASTER
Operadio Mfg. Co.
SPEED CLAMPS
Stanwood Products Inc.
SPEED CLIPS
Stanwood Products Inc.
SPEE-DEE
Pass & Seymour
SPEEDEX
Lambert Lambert Mfg. Co.
SPEED IRON
Weller Mfg. Co.
SPEED NUTS
Tinnerman Products Inc.
SPEEDOMAX
Leeds & Northrup Co.
SPEED-X
Johnson Co., E. F.
SPEKALUMINITE
Special Chemicals Co.
SPEKLEEN
Special Chemicals Co.
SPEKWITE
Special Chemicals Co.
SPEKYELLO
Special Chemicals Co.
SPENCER
American Optical Co.
SPERRY DUPLEX
Sperry Gyroscope Co.
Div. of The Sperry Corp.
SPERRY REFLECTOGAGE
Sperry Products, Inc.
SPERRY REFLECTSCOPE
Sperry Products, Inc.
SPIN-HEX
Vaco Products Co.
SPINLAB
Special Instruments Laboratory, Inc.
SPINTITE
Stevens Walden Inc.
SPIRALINE
Superpenant Mfg. Co.
SPIRALOCK
Production Engrg. Co.
SPIRALON
Superpenant Mfg. Co.
SPIRAMEG
Sprague Electric Co.
SPIRASHIELD
Meter Co.
SPOTTING SCOPE
Bogen, Inc.
SPRAY
Paisley Products Inc.
SPRING-ACTION
Sheldon Electric Co.
SPRING-KING
Gorrell & Gorrell
SPRING-LIFE
Cook Electric Co.
SPRINGLOCK
Simmons Fastener Corp.
SPRING-LOCK ANTENNA
Oak Ridge Products Mfg. Div. of
Video Television, Inc.
SQUEEZ-GRIP
C.H. Two Fire Equipt. Co.
SQUEEZE-LOCK
Buchanan Electrical Products Corp.
SR-4
Baldwin Locomotive Works
SRHT
Boston Insulated Wire & Cable Co.
STABILFLO
Foxboro Co., The
STABILINE
Superior Electric Co.
STABILOG
Foxboro Co., The
STACO
Standard Electrical Products Co.
STA-KON
Thomas & Betts Co., Inc.
STANCOR
Standard Transformer Corp.
STANDARD
New York Belting & Packing Co.
STANDARD ARROW
National Company Bluffworth, Inc.
STANDARD BINNACLE
National Company Bluffworth, Inc.
STANDATROL
Burton Meter Co.
STANDLAC
Standard Varnish Works
STANDO
Stando Co., Norman H.
STANELCO
Standard Telephones & Cables Ltd.
STANTEL
Standard Telephones & Cables Ltd.
STANTOX
Standard Varnish Works
STAN-TRAN
Stanwick Welding Co.
STAR J
Horton Steatite Co.
Unit of Union Carbide & Carbon Corp.
STARKLINE
Stark Sound Engr. Corp.
STATISCOPES
Mosaic Fabrics Co.
STATOMIC
Mustang, Inc.
STA-TRAN
Stanwick Welding Co.
STEEL-SET
Stanley Products, Inc.
STERILAIRE
Stanley Home Products Inc.
STERILAMP
Westinghouse Electric Corp.
STERILZONE
Coleman Lamp
STERLING CABLES
Canada Wire & Cable Co. Ltd.
STETHERTRON
Mason Co., Inc.
STETHOSCOPE
Parker Engineering Co.
STEVENS
Arnold & Stevens Instruments, Inc.
STIKON
Rule de Forest, Inc.

STILBEST
Linick Chemical Co.
STOKATIMER
Mercoid Corp.
STONEHART
Titeflex, Inc.
STRAINALYZER
Electronic Tube Corp.
STRATOGRAPH
Panoramic Radio Products, Inc.
STRATOLLNET
Shure Brothers
STRATOPAX
Coca Electric Co.
STRATOSCOPE
Panoramic Radio Products, Inc.
STRATOVISION
Westinghouse Electric Corp.
STRESSITE
Amplex Div., Chrysler Corp.
STRING-A-LITE
Mines Equipment Division, Joy Mfg. Co.
STRIPMASTER
Ideal Industries, Inc.
STRIPOHM
Ward Leonard Electric Co.
STRIPSOL
Paisley Products, Inc.
STROBOCONN
Conn, Ltd., C. G.
STROBODYNE
Sperry Gyroscope Co. Div. of The Sperry Corp.
STROBOFLASH
General Radio Co.
STROBOLUX
General Radio Co.
STROBOTAC
General Radio Co.
STROWDER
Automatic Electric Co.
STRUX
du Pont de Nemours & Co., Inc., E. I., Plastics Dept.
STURTEVANT
Westinghouse Electric Corp.
STYRALOY
Dow Chemical Co.
STYRAMIC
Monsanto Chemical Co.
STYROL AC
Standard Varnish Works
STYRON
Dow Chemical Co.
SUB-CYCLE
Lorain Products Corp.
SUNFLASH
Kemlite Labs.
SUNSWITCH
Ripley Co., Inc.
SUPER-BEAM
J. F. D. Mfg. Co.
SUPER EX
Tairex, Inc.
SUPERFLAKE
Superior Flake Graphite Co.
SUPERIOR
Radiart Corp.
SUPERMALLOY
Arnold Engineering Co.
SUPER-OILITE
Amplex Div. Chrysler Corp.
SUPER PRO
Hammarlund Mfg. Co.
SUPER Q
Hallicrafters, Inc., Edwin J.
SUPERSEC
Lee Rubber Co.
SUPERSONIC
Dind Fasteners Co., Inc.
SUPERSONIC REFLECTOSCOPE
Sperry Products Inc.
SUPER TRACER
Precision Electronics
SUPERVAC
Speer Carbon Co.
SUPER-VIEW
Bosch Mfg. Corp., L. E.
SUPERWIRE
Audio, Inc.
SUPER X
Tairex, Inc.
SUPREME
Aire Industries
SUPREME
Phonograph Needle Mfg. Co., Inc.
SUPRO
Supreme Mfg. Co.
SURCO
Surprenant Mfg. Co.
SURE FLUX
New York Solder Co.
SURFACE-ANALYZER
Brush Development Co.
SUREX
Rice & Seymour, Inc.
SURFLEX
Surprenant Mfg. Co.
SWEATLESS
Paisley Products Inc.
SWEET
Jensen Industries, Inc.
SWELTERPROOF
Automotor Div. of Roanwell Corp.
SWING-WA
Trumbull Electric Mfg. Co.
SWITCH-LITE
Littelfuse, Inc.
SWITCH-O-LITE
Hoffman Engrng. Corp.
SYLPHON
Fulton Sylphon Div., Robertshaw-Fulton Controls Co.
SYLVALOY
Driver Co., Wilbur B.
SYMPHONY MASTER
Monitor Products Co.
SYNCHRO-CHEK
Sonic Equipment Co.
SYNCHRO-METER
Bailey Meter Co.
SYNCHRON
Hanson Mfg. Co.
SYNCHRONIZED
Self Winding Clock Co.
SYNCHRONODE
Crosley Corp.
SYNCHROTROL
Westinghouse Electric Corp.
SYNCHRO-VALVE
Bristol Co., The
SYNCROGEARS
U. S. Electrical Motors, Inc.
SYNCTRON
Dormitzer Electric & Mfg. Co., Inc.
SYNKOTE
Plastoid Corp.
SYNRUB
U. S. Rubber Co.
SYNTHINOL
Rome Cable Corp.
SYNTHITE
Delph Co., John C.
SYNTHOGRAPHIC
Synthane Corp.
SYNTHOLVAR
Varflex Corp.
SYNVAREN
Synvar Corp.
SYNVARITE
Synvar Corp.
SYNVAROL
Synvar Corp.
SYROCOWOOD
Syracuse Ornamental Co., Inc.
20th CENTURY
Electronic Devices Co.
T 9
Eidson Electronic Co.
TABBY
Division Lead Co.
TACO
Technical Appliance Corp.
TAG
Weston Electrical Instrument Corp.
TAKK-TRON
Takk Corp.
TAP
Continental Screw Co.
TAPE-O-GRAPH
Audio Industries
TAPE RECORDER
Ampex Electric Corp.
TAPER-TONE
Arrow Co., H. W.
TAPE TITE
Paisley Products Inc.
TAPETONE
Broadcasting Program Service
TAPMASTER
Dudlon Electric Co.
TARRYTRON
Cook Electric Co.
TATTELITE
Littelfuse, Inc.
T.C.C.
Telegraph Condenser Co., Ltd.
TEC
Television Equipment Corp.
TECO
Telecomic Engineering Corp.
TEFLON
E. du Pont de Nemours & Co., Inc., E. I.
TEFSILON
Boston Insulated Wire & Cable Co.
TEKTOR
Flexible Electronics Inc.
TEL-A-COR
Magnetic Cure Corp.
TELAMP
Miller Reproducer Co., Inc.
TELANTUNE
Crystal Devices Co., Inc.
TELCOARC
Western Union Telegraph
TELECAP
Sprague Electric Co.
TELECLEAR
House of Television, Inc.
TELECOMMAND
Flader, Inc., Frederic
TELECOUPLER
Television Equipment Corp.
TELEDELTOS
Western Union Telegraph Co.
TELEDIPHONE
Marconi Inc., Thomas A.
TELEDYNE
Flader, Inc., Frederic
TELEFAX
Western Union Telegraph Co.
TELEFILTER
House of Television, Inc.
TELEFLIGHT
Flader Inc., Frederic
TELEGLAS
Pittsburgh Plate Glass Co.
TELEHOME
Webster Electric Co.
TELEKRYPTON
Western Union Telegraph Co.
TELEMARK
Leupold & Stevens Instruments
TELEMETROSCOPE
Deutschmann Corp., Tobe
TELEMIKE
Miles Reproducer Co., Inc.
TELEMIRROR
House of Television Inc.
TELEPAGE
Webster Electric Co.
TELEPHOTO
Acme Teletronix Div. of NLA Service, Inc.
TELEPLATE
Whitney Blake Co.
TELEPRENE
Whitney Blake Co.
TELE-ROTOR
Radiart Corp.
TELESET
Telex, Inc.
TELESONIC
U. S. Television Mfg. Corp.
TELESPATCH
Webster Electric Co.
TELESPEAKER
Telex, Inc.
TELESYMPHONIC
U. S. Television Mfg. Corp.
TELETALK
Webster Electric Co.
TELETHERM
Westinghouse Electric Corp.
TELETORQUE
Kollsman Instrument Div. of Square D Co.
TELETRAP
Crystal Devices Co., Inc.
TELEVAC
Fredericks Co., Geo. E.
TELEVERTER
James Vibrapower Co.
TELEVOX
Westinghouse Electric Corp.
TELE-ZOOM
Garod Majestic Corp.
TEL-OHMIKE
Sprague Electric Co.
TELOPTICAN
Gray Mfg. Co.
TEL-TENNA
Precision Plastic Products Inc.
TEL-TENNA
Television Laboratories, Inc.
TELVAR
Audar, Inc.
TELVUER
Television Projects, Inc.
TEMCO
Transmitter Equipment Co., Inc.
TEMP COP
Micro Switch
Div. of First Industrial Corp.
TEMSTART
Synchro Start Products, Inc.
TENITE
Tennessee Eastman Corp.
Div. Eastman Kodak
TENITE I
Tennessee Eastman Corp.
Div. Eastman Kodak
TENITE II
Tennessee Eastman Corp.
Div. Eastman Kodak
TENNA-ROTOR
Alliance Mfg. Co.
TENNASTUB
Crystal Devices Co., Inc.
TENSIOMETER
Soil Instrument Co.
TENSITE
Driver Co., Wilbur B.
TENS-O-TROL
Dillon & Co., Inc., W. C.
TERMALINE
Bird Electronic Corp.
TERMAND
Sherbrooke Electrical Products Corp.
TERROMETER
Engineering Research Corp.
TESCO
Eastern Specialty Co.
TESTLITE-FUSPUL
Dante Electric Mfg. Co.
TEST-MIKE
Connelly Dubilier Electric Corp.
TEST-O-LITE
Bosch Mfg. Corp.
TEST-MASTER
Precision Apparatus Co.
TETCO
Electric Tachometer Co.
TEXTOLITE
General Electric Co.
THERACOUPLER
Marconi Instruments Ltd.
THERA-RAY
Edin Electronics Co.
THERATHERM
Marconi Instruments Ltd.
THERMALARM
Eastern Specialty Co.
THERMALL
Lafave & Associates, W. T.
THERM-A-NEERING
Westinghouse Electric Corp.

THERMATRON
Radio Receptor Co.
THERMEX
Gardner Corp.
Thermex Division
THERMITE
Thermionic Engrg. Corp.
THERMOCAP
Niagara Electron Laboratories
THERMO-CONTAX
Rotax Instruments, Inc.
THERMO-GRIP
Ideal Industries, Inc.
THERMOGUARD
Westinghouse Electric Corp.
THERMO-HUMIDIGRAPH
Bristol Co., The
THERMOIL-GRANODINE
American Chemical Paint Co.
THERMOLAIN
Cole Porcelain Co.
THERMOLAST
Elmatic Equipt. Corp.
THERMO-LO
Farrelloy Co.
THERMOMETAL
Wilson Co., The, H. A.
THER-MONIC
Induction Heating Corp.
THERMOPLAX
Cutler-Hammer, Inc.
THERMOSEN
Sorensen & Co.
THERMO-SNAP
Jennings Thermostat Co.
THERMOSWITCH
Fenwal, Inc.
THERM-O-TROLS
Wheelco Instruments Co.
THERMOVERTER
Bristol Co., The
THER-MU-TROL
Mu-Switch Co.
THESAURUS
Radio Corp. of America
THINEX
Dixon Crucible Co., Joseph
THRED-LOCK
Continental Screw Co.
THREDMOUNT
National Union Radio Corp.
THROTTLTROLS
Wheelco Instruments Co.
THYURAY
Dynex Products, Inc.
TICONDEROGA
Dixon Crucible Co., Joseph
TIDLETRIK
American Lava Corp.
TI-MATIC
Westinghouse Electric Corp.
TIME-AID
Ranger Electric Co.
TIMEFAX
Times Facsimile Corp.
TIME-MASTER
Dictaphone Corp.
TIME-O-GRAF
Gibbs Div.
Wm. W. Gibbs Corp.
TIME-O-LITE
Industrial Timer Corp.
TIM-O-LUX
Edward Mfg. Co., Inc.
TIM-U-LATOR
Gorrell & Gorrell
TINOL
American Solder & Flux Co.
TINY GLOW
Industrial Devices, Inc.
TINY TIM
Shure Brothers
TIREX
Simplex Wire & Cable Co.
TITAN
General Lead Batteries Co.
TITAN
Titan Corp.
TITE-BIND
Thomas & Betts Co., Inc.
TITE-BITE
Thomas & Betts Co., Inc.
TITEGRIP
Dunco Electric Mfg. Co.
TITONE
Titone Corp.
TITRALOG
Consolidated Engineering Corp.
TITRIMETER
Fisher Scientific Co.
TITROMETER
Precision Scientific Co.
TOCCO
Ohio Crankshaft Co., Tocco Div.
T. W.
Paisley Products, Inc.
TOCCOTRON
Ohio Crankshaft Co., Tocco Div.
TOK FONE
Kapp Electronics Corp.
TOM THUMB
Allegheny Ludlum Steel Corp.
TONG TEST
Columbia Electric Mfg. Co.
TONG TEST
Martindale Electric Co.
TOP HAT
Times Facsimile Corp.

TOPHET
Driver Mfg. Co., Wilbur B.
TORAC
Morrill & Morrill
TORKOTHERM
Tork Clock Co.
TORQUE DRIVE
Electro-Voice, Inc.
TORKMASTER
Tork Clock Co., Inc.
TORRIDAL
Coildrion Co.
TORSIOGRAPH
Instruments Research Labs., Inc.
TORSIOMETER
Commercial Research Labs., Inc.
TOUCH-TIMER
Kay Electric Co.
TRAFF-O-MATIC
Automatic Signal Division
TRAIL BLAZER
Mark Industries, John
TRANCORS
Arnold Electric Co., Inc.
TRANSFAX
Eastman Kodak Co., Industrial Photographic Sales Div.
TRANSFILTER
Bruch Development Co.
TRANSFLEX
Insulation Varnish & Insulator Co.
TRANSITE
Johns-Manville Sales Corp.
TRANSITONE
Philco Corp.
TRANSKOTE
Pevons Mirrors, Inc.
TRANS-METER
Electronic Specialty Co.
TRANS-O-METER
Weston Electric Corp.
TRANSVERTER
Hertner Electric Co.
TRAVERTONE
Armstrong Cork Co.
TRI-CORE
Alpha Metals, Inc.
TRIG
Raytac Corp.
TRI-LOK
Boots Aircraft Nut Corp.
TRIMAIR
Cardwell Mfg. Corp., Allen D.
TRIMTHERM
General Controls Co.
TRI-O-MATIC
V-M Corp.
TRI-O-SPEED
V-M Corp.
TRIONIC
Clarkstan Corp.
TRONEX
Alleghan Co., T. C., Industrial Div.
TRUARC
Waldes Kohinoor Inc.
TRUE-BRAND
Carborundum Industries, Inc.
TRU-FIDELITY
Thordarson Electric Mfg. Div.
Maguire Industries, Inc.
TRUFLEX
General Plate Division, Metals & Controls Corp.
TRU-FLEX
Pennant Photo Products
TRU-GRAF
Pennant Photo Products
TRU-OHM
Model Engrng. & Mfg. Co.
TRUSCON
Republic Steel Corp.
TRU-SONIC
Stentorel Mfg. Corp.
TRYLON
Arvol Turbine Co., Tower & Antenna Div.
TUBE-MASTER
Radiation Association Co.
TUBE-U-LAR
Pyramid Electric Co.
TUFFERNELL
Westinghouse Electric Corp.
TUFFY
Insulation Manufacturers Corp.
TUFLEC
Laminated Plastics Inc.
TUNBO
Brand & Co., Wm.
TURBO-PRENE
Brand & Co., Wm.
TURBOTHERM
Brand & Co., Wm.
TURQUOISE
Eagle Pencil Co.
TWIN-FAST
Blake & Johnson Co.
TWINTACTS
Ideston Electrical Instrument Co.
TWIN-TRAY
Amer. Dev. Corp. of America
TWINKORD
Amphenol Electrical Co.
TWINSET
Tenex, Inc.
TWINSULATION
U. S. Rubber Co.
TWISTAB
National Union Radio Corp.

TWIST-LOCK
Hubbell, Inc., Harvey
TWIST-LOK
Sprague Electric Co.
TWIST-MOUNT
Pyramid Electric Co.
TWIST-TITE
Hubbell, Inc., Harvey
TY-DOWN
Air Associates, Inc.
TYGON
U. S. Stoneware Co.
TY-LOK
Air Associates, Inc.
TYLOX
Hamilton Kent Mfg. Co., Inc.
TYMIT
Tork Clock Co.
TYNEE-DRY
Pyramid Electric Co.
TYPE-O-WRITER
Kellogg Switchboard & Supply Co.
TYPHONITE ELDORADO
Dixon Crucible Co., Joseph
TZUCOPY PHOTE
General Photo Products Co., Inc.
UBABOND
Union Bay State Chemicals Co.
UBAGRIP
Union Bay State Chemical Co.
UBAPOL
Union Bay State Chemical Co.
UBATEX
Union Bay State Chemical Co.
U-GRIP
Aircraft-Marine Products, Inc.
ULTRACOMPACT
United Transformer Co.
ULTRASCALER
Nuclear Instrument & Chemical Corp.
ULTRASONORATOR
Crystal Research Labs., Inc.
ULTRATONE
Audio Industries
ULTRON
Monsanto Chemical Co., Plastics Div.
UMP
Illinois Condenser Co.
UNBRAKO
Standard Pressed Steel Co.
UNDARK
U. S. Radium Corp.
UNIBALLASTS
National Union Radio Corp.
UNICLOSED
U. S. Electrical Motors, Inc.
UNICON
United Condenser Corp.
UNI-CRIMP
Sherman Mfg. Co., H. B.
UNIDYNE
Shure Brothers, Inc.
UNI-FLEX
Dimore Co., The
UNIFLEX
Mikkelle Infex Red Co.
UNI-FLOW
Barber-Colman Co.
UNILINE
Kahl & Seymour, Inc.
UNI-MATIC
Cubert Engineering & Electronics Co.
UNIONMELT
Linde Air Products Co., Unit of Union Carbide & Carbon Corp.
UNIPLEX
Shure Brothers, Inc.
UNIPOINT
Shure Brothers, Inc.
UNIPOLE
Andrew Co.
UNITACT
Bristol Co., The
UNITED
Jackson Industries, Inc.
UNITRAD
Crosley Corp.
UNIVAC
Eckert-Mauchly Computer Corp.
UNIVERSAL
Mueller Electric Co.
UNIVERSAL
Davis & Murphy
UNIVIBES
National Union Radio Corp.
UPSON
Republic Steel Corp.
URAC
American Cyanamid Co., Plastics Div.
URELITE
I-T-E Circuit Breaker Co.
UST
U. S. Television Mfg. Corp.
USALITE
Stockalf Ceramic & Mfg. Co.
USECO
U. S. Engineering Co.
USEMENT
U. S. Rubber Co.
USEX
U. S. Rubber Co.
USEX ASBOSEALED
U. S. Rubber Co.
USKORONA
U. S. Rubber Co.

USPRENE
U. S. Rubber Co.
USRUB
U. S. Rubber Co.
U.S.S.
Carnegie-Illinois Steel Corp.
U.S.S. AMERICAN
American Steel & Wire Co.
UTC
United Transformer Corp.
UTILASTIC
Paisley Products, Inc.
UTILIPHONE
National Electronic Labs., Inc.
V-MEAT
Electric Eye Equipment Co.
V-KING
Schott Co., Walter L.
VACOMBO
Vaco Products Co.
VACOPAK
Vacolite Co.
VACTITE
Locke Incorporated
VACTU-PAK
Allen-Howe Electronics Corp.
VACTU-PHONE
Allen-Howe Electronics Corp.
VALVRATORS
Fischer & Porter Co.
VALVSEAL
Richardson Co.
VAN de GRAAFF
High Voltage Engineering Corp.
VAPO
Pfaff Co., Frederick
VAREC
Vapor Recovery Systems Co.
VARGLAS
Varflex Corp.
VARIAC
General Radio Co.
VARIATEN
Shallcross Mfg. Co.
VARIDRIVES
U. S. Electrical Motors, Inc.
VARIMATCH
United Transformer Corp.
VARIPLOTTER
Electronic Associates, Inc.
VARIPOWER
United Transformer Corp.
VARITONE
Fischer, Inc., Frederic
VARITRAN
United Transformer Corp.
VARITRON
Photographic Products, Inc.
VARITRONIC
Electron Equipment Corp.
VARI-VOLT
Minneapolis Co., The
VASCO
Mineral Industries, Inc.
VAW METER
Fluke Engineering Co., John
VEECO
Vacuum Electronic Engineering Co.
VEE-D-X
Corhart Plasmomold Corp.
VEGETOL
Cornell-Dubilier Electric Corp.
VEGIMAL
Paisley Products, Inc.
VELOMETER
Illinois Testing Labs., Inc.
VENOLITES
Drake Mfg. Co.
VERICON
Pennington Radio, Inc.
VERITHIN
Eagle Pencil Co.
VERNIER-SET
Automatic Temperature Control Co., Inc.
VERSACONE
Radio Merchandise Sales
VERSALITE
U. S. Rubber Co.
VERSATEX
Shure Brothers
VIBESTON
U. S. Rubber Co.
VIBRALOC
Topping Mfg. Co.
VIBRAPAK
Mallory & Co., Inc., P. R.
VIBRASENDER
Motorola Inc.
VIBRASHOCK
Robinson Aviation, Inc.
VIBRASPONDER
Motorola Inc.
VIBRGGROUND
Associated Research Inc.
VIBROMETER
Televiso Products, Inc.
VIBROMIKE
Brush Development Co.
VIBROTEST
Associated Research, Inc.
VICALLOY
Arnold Engineering Co.
VICTOR
Radio Corp. of America
VICTROLA
Radio Corp. of America
VICTRON
Victor Electric Products, Inc.
VIDEO BEAM
Camburn, Inc.
VIDEOCOUPLER
Mallory & Co., Inc., P. R.
VIDEOLA
Tech-Master Products Co.
VIDEON
Tele-Video Corp.
VIDEOSET
Video Corp. of America
VIDEOTRON
National Union Radio Corp.
VIDI MASTER
Communication Measurements Lab.
VIEWLITE
Viewlex Inc.
VIEWMATIC
Viewlex Inc.
VIEWTALK
Viewlex Inc.
VIKANE
Cornell-Dubilier Electric Corp.
VIMLITE
Celanese Corp. of America
VINYL
Alpha Wire Corp.
VINYLITE
Bakelite Div., Union Carbide & Carbon Corp.
VINYLSEAL
Bakelite Corp.
VINYON
Bakelite Corp.
VIPOWER
Cornell-Dubilier Electric Corp.
VIPOWER
Radiart Corp.
VISABLE PROOF
Electric Heat Control Co., The
VISAFLAME
Mercoid Corp.
VISCOR
Weston Electrical Instrument Co.
VISICODE
Westinghouse Electric Corp.
VISITRON
Rauland Corp.
VISO-CARDIETTE
Canboro Co.
VISUAL GAGE
Sheffield Co.
VITAMIN Q
Sprague Electric Co.
VITAVOX
Radionic Transformer Co.
VITROHM
Ward Leonard Electric Co.
VITROLAIN
Star Porcelain Co.
VIZ
Molded Insulation Co., Aircraft Control Div.
VOCAL-AIRE
Dilks Co., The
VOICE OF THEATRE
Altec Lansing Corp.
VOICEWRITER
Edison Inc., Thomas A.
VOLSTAT
Industrial Transformer Corp.
VOLTALAC
Standard Varnish Works
VOLT-AMP
Industrial Devices, Inc.
VOLTASCOPE
Polaroid Electronics Corp.
VOLTBOX A-C
Superior Electric Co.
VOLTOHMYST
Radio Corporation of America
VOLTROL
Aime Electric Corp.
VOLTRON
Industrial Synthetics Corp.
VOMAX
McMurdo Silver Co., Inc.
VOYCALL
Lake Mfg. Co.
VUELITE
Monsanto Chemical Co., Plastics Div.
VUEPAK
Monsanto Chemical Co., Plastics Div.
VUE-SCOPE
Celomat Corp.
VULCATEX
Hode Co., Inc., A. C.
VULCOID
Continental Diamond Fibre Co.
VYCOR
Corning Glass Works
WABLQUIST
Nelson Electrical Laboratory, Inc.
WAHLQUIST
Nelson Electrical Laboratory, Inc.
WALCO
Electrowax Co., Inc.
WALDES TRUARC
Waldes Kohinoor, Inc.
WALSCO
Schott Co., Walter L.
WATCHMASTER
American Time Products, Inc.
WATERWITE
Bache & Co., Semon
WAXMASTER
Aeroil Products Co.
W. D. C.
Paisley Products Inc.
WEDGE-GRIP
Sherman Mfg. Co., H. B.
WEDGE-ON
Thomas & Betts Co., Inc.
WEDGIE
Insulation Manufacturers Corp.
WEIGER-WEED
Fansteel Metallurgical Corp.
WEILCO
Weil & Co., J. H.
WEILETTE
Weil & Co., J. H.
WEILINE
Weil & Co., J. H.
WELDRAWN
Superior Tube Co.
WELDOMATIC
Westinghouse Electric Corp.
WELD-O-TIMER
Westinghouse Electric Corp.
WELD-O-TROL
Westinghouse Electric Corp.
WELDPOWER
Raytheon Mfg. Co.
WEMCALLOY
Westinghouse Electric Corp.
WESTACH
Westberg Mfg. Co.
WHARFEDALE
British Industries Corp.
WHEELOCK
Signal Engineering & Mfg. Co.
WINCHESTER
Olin Industries, Inc.
WILCO
Wilson Co., The, H. A.
WINCO
Wincharger Corp.
WIPERMALLOY
United Transformer Corp.
WIREMASTER
Precision Audio Prods., Inc.
WIRE-NUTS
Ideal Industries, Inc.
WIREPHONE
Molded Insulation Co., Aircraft Control Div.
WIRETONE
Molded Insulation Co., Aircraft Control Div.
WIREWATT
Ohmite Mfg. Co.
WISSCO
Wickwire Spencer Steel Div.;
The Colorado Fuel & Iron Corp.
WOOD GLU
Paisley Products Inc.
WOODITE
Syracuse Ornamental Co., Inc.
WOODWELDER
Short Wave Plastic Forming Co.
WOODWIN
Wood Electric Co., Inc., C. D.
WRIGHTFLOR
Taylor Mfg. Co.
WRINCO
New Wrinkle, Inc.
WRINTEX
New Wrinkle, Inc.
WYD-ANGLE
Ess Instrument Co.
XACTEMP
Gordon Co., Claud S.
XACTLINE
Gordon Co., Claud S.
XCELITE
Pink Metalware Co.
XENOFLASH
Triumph Mfg. Co.
X-PRESS
Cook Electric Co.
XRD
General Electric X-Ray Corp.
X-VAR
Fidelity Chemical Products Corp.
X-WASHERS
Standard Locknut & Lockwashers, Inc.
Z ANGLE
Technology Instrument Corp.
"Z" NICKEL
International Nickel Co., Inc., The
ZAHODIAKIN
Scovill Mfg. Co.
ZENEL
Burney Forge & Tool Works
ZERO READER
Sperry Gyroscope Co. Div. of The Sperry Corp.
ZIPCORD
U. S. Rubber Co.
ZIPOHMS
Muter Co.
ZIP-IN
American Phenolic Corp.
ZIRCONARC
Fish-Schurman Corp.
ZIRMET
Foote Mineral Co.
ZOOMAR
Television Zoomar Corp.
ZYROX
Halowax Products Division
Union Carbide & Carbon Corp.

1950-1951 ELECTRONICS BUYERS' GUIDE

MANUFACTURERS INDEX

A listing of the companies engaged in the manufacture of all types of electronic components and complete electronic equipment. They are alphabetically arranged for convenient use and quick reference.

A. B. C. Radio Laboratories, 5334 N. New Jersey St., Indianapolis 5, Ind.
A. P. W. Co., 72 W. Main St., Rockaway, N. J.
Abalon Precision Mfg. Corp., 540 Casanova St., Bronx 59, N. Y.
Accurate Paper Tube Co., 851 N. Noble St., Chicago 22, Ill.
Accurate Spring Mfg. Co., 3811 W. Lake St., Chicago, Ill.
Ace Engineering & Machine Co., 3642 N. Lawrence St., Philadelphia 40, Pa.
Ace Spring Mfg. Co., 77 W. Houston St., New York 12, N. Y.
Acheson Colloids Corp., Port Huron, Mich.
Ackerman-Johnson Co., 625 W. Jackson Blvd., Chicago 6, Ill.
Acklin Stamping Co., 1923 Nebraska Ave., Toledo 7, Ohio.
Acme Battery Co., 59 Pearl St., Brooklyn, N. Y.
Acme Electric Corp., 31 Water St., Cuba, N. Y.
Acme Electric Heating Co., 1217 Washington St., Boston, Mass.
Acme Folding Box Co., Inc., 141 E. 25th St., New York, N. Y.
Acme Telectronics Div. of NEA Service, Inc., West Third & Lakeside, Cleveland 13, Ohio.
Acme Wire Co., New Haven 14, Conn.
Acro Electric Co., 1316 Superior Ave., Cleveland 14, Ohio.
Acro Products Co., 6330 Baltimore Ave., Philadelphia, Pa.
Acro Transformer Mfg. Corp., 21-20 33rd Ave., Long Island City, N. Y.
Acromark Co., The, 442 Morrell St., Elizabeth 4, N. J.
Acton Co., Inc., R. W., 370 7th Ave., New York 1, N. Y.
Adair & Rhomstine, 514 Bewaldeo St., Detroit 26, Mich.
Adams & Westlake Co., Michigan St., Elkhart, Ind.
Adaptal Co., 120 New Lots Ave., Brooklyn, N. Y.
Ade Precision Products Corp., 10777 Van Owen St., Burbank, Calif.
Admiral Corp., 3800 Cortland St., Chicago 47, Ill.
Advance Electric & Relay Co., 2435 Naomi St., Burbank, Calif.
Advance Recording Products Co., 36-12 34th St., Long Island City, N. Y.
Aerovox Equipment Corp., 1412-0 Central St., Kansas City 10, Mo.
Aero Needle Co., 619 N. Michigan Ave., Chicago 11, Ill.
Aerol Products Co., Wesley St., South Hackensack, N. J.
Aerolite Electronic Hardware Corp., 507-26th St., Union City, N. J.
Aerolux Light Corp., 457-11th Ave., New York 19, N. Y.
Aeronautical Communication Equipment, Inc., 6000 Douglas Rd., Miami 33, Fla.
Aeronautical Radio Mfg. Co., 100 First St., Mineola, N. Y.
Aerovox Corp., 740 Belleville Ave., New Bedford, Mass.
Aim Industries, 41 Union Sq., New York 3, N. Y.
Air Associates, Inc., Teterboro, N. J.
Air-King Products Co., Inc., 155 53rd St., Brooklyn, N. Y.
Airborne Electronics Co., Metropolitan Airport Hangar No. 3, Van Nuys, Calif.
Airborne Instruments Lab., Inc., 160 Old Country Rd., Mineola, N. Y.
Aircraft Electronics Association, Inc., 1041 New Britain Ave., Hartford 10, Conn.
Aircraft Marine Products, Inc., 1535 S. Fourth St., Harrisburg, Pa.
Aircraft Radio Corp., Boonton, N. J.
Aircraft-Ace, Inc., 241 Fairfield Ave., Upper Darby, Pa.
Airtechnic, Inc., P. O. Box 161, Caldwell, N. J.
Airpax Products Co., 1024 Hammonds Ave., Baltimore 2, Maryland.
Airplane & Marine Instruments, Inc., Clearfield, Pa.
Airtron, Inc., 101 E. Elizabeth Ave., Linden, N. J.
Airtronics Mfg. Co., 5141 W. San Fernando Rd., Los Angeles 39, Calif.
Alan Electronics Corp., Alan Park, Stapleton 1, N. Y.
Alarm Processing Co., Akron 14, Ohio.
Aladdin Radio Industries, Inc., 501 W. 35th St., Chicago 16, Ill.
Alden Products Co., 117 No. Main St., Brockton 64, Mass.
Aldine Paper Co., Inc., 535 5th Ave., New York 17, N. Y.
Alfax Paper & Engineering Co., 40 Riverside Ave., Brockton 27, E. B., Mass.
Ali American Tool & Mfg. Co., 1014 W. Fullerton St., Chicago 14, Ill.
All Weather Springs, 140 Cedar St., New York 6, N. Y.
Allegheny Ludlum Steel Corp., H. W. Oliver Bldg., Pittsburgh 22, Pa.
Allen Co., L. B., Inc., 6751 Bryn Mawr Ave., Chicago 31, Ill.
Allen-Bradley Co., 136 W. Greenfield Ave., Milwaukee 4, Wis.
Allen Mfg. Co., Hartford, Conn.
Alliance Mfg. Co., Lake Park Blvd., Alliance, Ohio.
Allied Control Co., Inc., 2 East End Ave., New York 21, N. Y.
Allied Radio Corp., 833 W. Jackson Blvd., Chicago 7, Ill.
Allied Recording Products Co., 21-09 43rd Ave., Long Island City 1, N. Y.
Allis-Chalmers Mfg. Co., 935 South 70th St., Milwaukee 1, Wis.
Allis Co., Louis, 427 E. Stewart St., Milwaukee 7, Wis.
Allmetal Screw Products Co., Inc., 31 Greene St., New York 13, N. Y.
Allmetal Spinning & Stamping Co., 1820 Willoughby Ave., Brooklyn, N. Y.
Alloy Metal Wire Co., 13th & Penna. Ave., Prospect Park, Pa.
Alpha Laboratories, Box 164 Belmar, N. J.
Alpha Metals, Inc., 363 Hudson Ave., Brooklyn 1, N. Y.
Alpha Wire Corp., 50 Howard St., New York, N. Y.
Alter Lansing Corp., 161 Avenue of the Americas, New York 13, N. Y.
Aluminum Co. of America, Gulf Bldg., Pittsburgh, Pa.
Amalgamated Electronics, Electronics Road, Clinton Corners, N. Y.
Ambroid Co., 525 Franklin St., Boston 10, Mass.
American British Technology Inc., 57 Park Ave., New York 16, N. Y.
American Chemical Paint Co., Ambler, Pa.
American Chronoscope Corp., 316 W. First St., Mt. Vernon, N. Y.
American Communications Corp., 306 Broadway, New York 7, N. Y.
American Condenser Co., 4410 Ravenswood Ave., Chicago 40, Ill.
American Cyanamid Co., Plastics Div., 30 Rockefeller Plaza, New York 20, N. Y.
American Diathermy Productions, 11240 W. Olympic Blvd., Los Angeles 25, Calif.
American Electric Cable Co., 181 Appleton St., Holyoke, Mass.
American Electric Motors, Inc., Los Angeles, Calif.
American Electrical Heater Co., 6110 Cass Ave., Detroit 2, Mich.
American Electroneering Co., 2112 S. La Brea Ave., Los Angeles, Calif.
American Electronics Corp., 226 No. Fourth St., Columbus 15, Ohio.
American Emblem Co., Inc., P. O. Box 116, R. Utica, N. Y.
American Gas Accumulator Co., 1039 Newark Ave., Elizabeth, N. J.
American Hard Rubber Co., 31 Mercer St., New York 13, N. Y.
American Instrument Co., 8030 Georgia Ave., Silver Spring, Md.
American Insulated Cord, New Freedom, Pa.
American Knee Vol Practice, 57 Thames St., Brooklyn 6, N. Y.
American Lubricator Corp., 333 W. 52nd St., New York 19, N. Y.
American Lava Corp., Chattanooga 5, Tennessee.
American Magnesium Co., 970 So. East Bias Ave., Florence 2, Calif.
American Molded Products Co., 1844 N. Hoyne St., Chicago 22, Ill.
American Nut & Bolt Fastener Co., 2006 Thorn St., Pittsburgh 12, Pa.
American Optical Co., Scientific Instrument Div., Box A, Buffalo 15, N. Y.
American Phenolic Corporation, 1830 S. 54th Ave., Chicago 50, Ill.
American Platinum Works, N.J.R.R. Ave. at Oliver St., Newark 5, N. J.
American Products Mfg. Co., Oakdale & Dublin St., New Orleans 18, La.
American Radiomics Co., 83 Flatbush Ave., Brooklyn, N. Y.
American Radio Hardware Co., 152 Marguerite Pkwy., South Mount Vernon, N. Y.
American Relay & Controls Inc., 4901 W. Flournoy St., Chicago 44, Ill.
American Scientific Co., P. O. Box 1, High Bridge Station, New York 52, N. Y.
American Screw Co., Willimantic, Conn.
American Solder & Flux Co., 2112 E. Norris St., Philadelphia 25, Pa.
American Steel & Wire Co., U. S. Steel Corp. Subsidiary, Rockefeller Bldg., Cleveland 13, Ohio.
American Structural Products Co., Toledo 1, Ohio.
American Television Inc., 623 S. Plymouth St., Chicago 6, Ill.
American Television & Radio Co., 300 E. 4th St., St. Paul 1, Minn.
American Thermo Electric Co., 67 E. 8th St., New York 3, N. Y.
American Time Products, Inc., 580 Fifth Ave., New York 19, N. Y.
American Transformer Co., 285 Emmett St., Newark, N. J.
Amglo Corp., 4234 Lincoln Ave., Chicago 18, Ill.
Amperex Electronic Corp., 25 Washington St., Brooklyn 1, N. Y.
Amperite Co., 561 Broadway, New York 12, N. Y.
Ampex Electric Corp., 1155 Howard Ave., San Carlos, Calif.
Amplex Division, Chrysler Corp., Detroit 31, Mich.
Amplifier Corp. of America, 396 Broadway, New York 13, N. Y.
Ampro Corp., 2835 North Western Ave., Chicago 18, Ill.
Amy, Aceves & King Inc., 11 W. 42nd St., New York 18, N. Y.
Anaconda Wire & Cable Co., 25 Broadway, New York 4, N. Y.
Analysis Instrument Co., P. O. Box 231, East Paterson, N. J.
Anchor Metal Co., 87 Walker St., New York 13, N. Y.
Anchor Plastics Co., Inc., 533-541 Canal St., New York 13, N. Y.
Anchor Radio Corp., 2215 South St., Chicago 23, Ill.
Anchor Webbing Co., P. O. Box 1624, Providence, R. I.
Anderson, Arthur R., 110 Woodbury Ave., Springdale, Conn.
Andrea Radio Corp., 27-01 Bridge Plaza North, Long Island City 1, N. Y.
Andrew Corp., 363 E. 75th St., Chicago 19, Ill.
Anny Co., R. B., 1101 N. Delaware St., Indianapolis, Ind.
Anoco Div., General Aniline & Film Corp., Binghamton, N. Y.
Ansley Radio & Television Inc., 41 St. Joes Ave., Trenton 9, N. J.
Ansonia Electrical Co., 63 Main St., Ansonia, Conn.
Antenna Products, General Aniline & Film Corp., 444 Madison Ave., New York 22, N. Y.
Antenna Research Lab., Inc., 792 Thomas Lane, Columbus 9, Ohio.
Anton Electronic Laboratories, Inc., 1226-1238 Flushing Ave., Brooklyn 6, N. Y.
Apahouser Corp., 104 Brookline Ave., Boston, Mass.
Applied Electronics Co., 1246 Folsom St., San Francisco 3, Calif.
Applied Physics Corp., 30 W. Green St., Pasadena 1, Calif.
Applied Research Labs., 4336 San Fernando Rd., Glendale 4, Calif.
Applied Science Corp. of Princeton, The, P. O. Box 44, Princeton, N. J.
Approved Electronic Instrument Corp., 142 Liberty St., New York 6, N. Y.
Arc Radio Corp., 523 Myrtle Ave., Brooklyn, N. Y.
Arch Gear Works, Inc., Quincy, Mass.
Arcturus Electronics, Inc., 54 Clark St., Newark, N. J.
Argus, Inc., Ann Arbor, Mich.
Ark-Les Switch Corp., 55 Water St., Watertown 72, Mass.
Arlington Electric Products Inc., 500 W. 52nd St., New York 19, N. Y.
Arma Corp., 254 36th St., Brooklyn 32, N. Y.
Armo Steel Corp., 703 Curtis St., Middletown, Ohio
Armstrong Cork Co., Lancaster, Pa.
Arnold Engineering Co., 147 E. Ontario St., Chicago 11, Ill.
Arnt Expansion Bolt Co., Bowie Ave., Marion, Ohio.
Arrow Hart & Hegeman Co., 103 Hawthorne St., Hartford, Conn.
Art-Line Metal Products Corp., 2973 Cropsey Ave., Brooklyn 14, N. Y.
Art-Leaf Stamping Co., 3610 Palisade Ave., Union City, N. J.
Art Wire & Stamping Co., 227 High St., Newark 2, N. J.
Askania Regulator Co., 240 E. Ontario St., Chicago 11, Ill.
Aspinwall Products, Inc., Chagrin Falls 6, Ohio.
Associated Production Co., 162 N. Clinton St., Chicago 6, Ill.
Associated Research, Inc., 3758 W. Belmont, Chicago 18, Ill.
Astatic Corp., The, Conneaut, Ohio.
Astrex Corp., 255 Grant Ave., East Newark, N. J.
Atlantic India Rubber Works, Inc., 571 Polk St., Chicago 7, Ill.
Atlas Coil Winders, Inc., Stamford, Conn.
Atlas Electric Products Co., P. O. Box 1591, Erie, Pa.
Atlas Sound Corp., 1443 39th St., Brooklyn 18, N. Y.
Atlas Tack Corp., Pleasant St., Fairhaven, Mass.
Atomic Instrument Co., 160 Charles Street, Boston, Mass.
Audak Co., 500 Fifth Ave., New York, N. Y.
Audio Development Co., 2833 13th Ave., S., Minneapolis 7, Minn.
Audio Devices, Inc., 444 Madison Ave., New York 22, N. Y.
Audio Equipment Co., 80-20 45th Ave., Elmhurst, N. Y.

Audio Equipment Sales, 153 W. 33rd St., New York 1, N. Y.
Audio Industries, Michigan City, Ind.
Audio Instrument Co., 1947 Broadway, New York 23, N. Y.
Autograph Co., 1414 El Camino Real, San Carlos, Calif.
Audio-Master Co., 21 W. 45th St., New York 19, N. Y.
Aurex Corp., 1117 N. Franklin St., Chicago 10, Ill.
Austin Co., D., 335 Throop Ave., Brooklyn 21, N. Y.
Auto Engraver Co., Inc., 1776 Broadway, New York, N. Y.
Autocall Co., The, Shelby, Ohio.
Autocrat Radio Co., 3855 N. Hamilton Ave., Chicago, Ill.
Automatic Coil Winder & Electrical Equipment Co., Ltd., Winder House, Douglas St., London, S. W. 1, England.
Automatic Electric Sales Corp., 1033 W. Van Buren St., Chicago 7, Ill.
Automatic Mfg. Corp., 65 Gouverneur St., Newark 4, N. J.
Automatic Metal Products Co., 315 Barry St., Brooklyn 1, N. Y.
Automatic Radio Mfg. Co., Inc., 122 Brookline Ave., Boston, Mass.
Automatic Signal Division, 100 Regent St., East Norwalk, Conn.
Automatic Switch Co., 391 Lakeside Ave., Orange, N. J.
Automatic Temperature Control Co., Inc., 5211 Pulaski Ave., Philadelphia 44, Pa.
Autoscreen Co., 216-222 W. 14th Street, New York, N. Y.
Autotron Co., The, Danville, Ill.
Avometer Div. of Rosewell Corp., 440 Pacific St., Brooklyn 17, N. Y.

B & C Insulation Products, Inc., Lincoln Highway, Iselin, N. J.
Bace Television Corp., Green & Lexington Sts., South Hackensack, N. J.
Bache & Co., Semon, 636 Greenwich St., New York 14, N. Y.
Bank Wire Corp., F. G., Room 2223, 500 Fifth Avenue, New York, N. Y.
Baer Co., N. S., 9 Montgomery St., Hillside, N. J.
Bailey Meter Co., 1044 Ivanhoe Road, Cleveland 10, Ohio.
Baird Associates, Inc., 33 University Rd., Cambridge 38, Mass.
Bakelite Div., Union Carbide & Carbon Corp., 30 East 42nd St., New York 17, N. Y.
Baker & Co., Inc., 113 Astor St., Newark 5, N. J.
Baldwin Electric Co., 4355 Duncan Ave., St. Louis, Mo.
Baldwin Locomotive Works, Philadelphia 42, Pa.
Ballantine Laboratories, Inc., Boonton, N. J.
Bamberger Corp., A., 44 Howes St., Brooklyn 11, N. Y.
Barber-Colman Co., Rockford, Ill.
Barker Labs., Alfred W., 32-44 Francis Lewis Blvd., Flushing, N. Y.
Barclay Instruments, Div., The Patent Button Co., Waterbury 88, Conn.
Bar-Ray Products, Inc., 209 25th St., Brooklyn 32, N. Y.
Bardeen & McAllister Div., P. O. Box 1310, Hollywood, California.
Barker & Williamson, 235 Fairfield Ave., Upper Darby, Pa.
Barnes-Gibson-Raymond Div., Associated Spring Corp., 6400 Miller Ave., Detroit 11, Mich.
Barnes Products Co., Inc., 84 Bowery, New York 13, N. Y.
Barrett Co., Leon J., P. O. Box 328, Worcester 1, Mass.
Barrett Bindery Co., 1332 W. Monroe St., Chicago 7, Ill.
Barrett-Varnish Co., 1532 S. 50th Court, Cicero 50, Ill.
Barry Corp., The, 174 Sidney St., Cambridge, Mass.
Bassett, Inc., Rex, 407-11 N. W. 1st Ave., Ft. Lauderdale, Fla.
Bauer & Black, 223 W. Adams St., Chicago, Ill.
Bausch & Lomb Optical Co., 635 St. Paul St., Rochester 2, N. Y.
Beach Precision Parts Co., Boonton, N. J.
Beach Russ Co., 50 Church St., New York 7, N. Y.
Beaz Chain Manufacturing Co., The, 110 Mountain Grove St., Bridgeport 5, Conn.
Beaver Gear Works, Inc., 1014 Parmele St., Rockford, Ill.
Beede Electrical Instrument Co., Inc., Penacook, N. H.
Behr-Manning Div. of Norton Co., Troy, N. Y.
Bel Fuse Inc., 311 Mountain Road, Union City, N. J.
Belden Mfg. Co., 4647 W. Van Buren St., Chicago 44, Ill.
Bell Sound Systems, Inc., 555 Marion Rd., Columbus 7, Ohio.
Bell Television, 147 West 42nd St., New York 17, N. Y.
Belmont Radio Co., Div. Raytheon Mfg. Co., 5921 W. Dickens Ave., Chicago 39, Ill.
Beltone Hearing Aid Co., Beltone Bldg., 1450 N. 19th St., Chicago 8, Ill.
Benjamin-Electric Mfg. Co., 2900 N. Pine Blvd., Los Angeles 6, Calif.
Bendix Aviation Corp., Pacific Division, 11600 Sherman Way, North Hollywood, Calif.
Bendix Radio Communications Division, Bendix Aviation Corp., Baltimore 4, Md.
Bentley Harris Mfg. Co., Conshohocken, Pa.
Berkeley Scientific Co., Richmond, Calif.
Berkshire Laboratories, P. O. Box 70, Concord, Mass.
Berliant Associates, 4917 W. Jefferson Blvd., Los Angeles 16, Calif.
Berndt-Bach, Inc., 7377 Beverly Blvd., Los Angeles 36, Calif.
Beryllium Corp., The, Reading, Pa.
Best Manufacturing Co., Inc., 1200 Grove St., Irvington 11, N. J.
Bestcraft Products, 14 Delancey St., New York, N. Y.
Beta Electric Corp., 1762 Third Ave., New York 29, N. Y.
Biddle Co., James G., 1316 Arch St., Philadelphia 7, Pa.
Bird Co., Richard H., 1 Spruce St., Waltham, Mass.
Bird Electronic Corp., 1800 E. 38th St., Cleveland 14, Ohio.
Birnbach Radio Co., Inc., 145 Hudson St., New York, N. Y.
Birtcher Corp., 5087 Huntington Drive, Los Angeles 32, Calif.
Bishop & Co., J., Platinum Works, Malvern, Pa.
Bishop Mfg. Corp., 254 W. 31st St., New York 1, N. Y.
Bittermann Electric Co., Box 665, Canaan, Conn.
Biwax Corp., 3445 Howard St., Skokie, Ill.
Blaco Mfg. Co., 6541 Euclid Ave., Cleveland 3, Ohio.
Blake & Johnson Co., Waterville 48, Conn.
Blair Knox Co., Farmers Bank Bldg., Pittsburgh, Pa.
Blaw Electric Co., Union Station Bldg., Erie, Pa.
Blum & Co., Julius, 532 W. 22nd St., New York 11, N. Y.
Bodine Electric Co., Ohio St. & Oakley Blvd., Chicago 12, Ill.
Boehme Inc., H. O., 915 Broadway, New York 10, N. Y.
Boesch Mfg. Corp., Danbury, Conn.
Bogen Co., Inc., David, 663 Broadway, New York 12, N. Y.
Bogue Electric Mfg. Co., 52 Iowa Ave., Paterson 3, N. J.
Bomac Laboratories, Beverly, Mass.
Bond Electric Corp., Div. of Olin Industries Inc., New Haven 4, Conn.
Bond Electronics Corp., 68 Franklin Place, Summit, N. J.
Bonney Forge & Tool Works, Allentown, Pa.
Boom Electric & Amplifier Co., 1227 W. Washington Blvd., Chicago 7, Ill.
Boonton Molding Co., Boonton, N. J.
Boonton Radio Corp., Boonton, N. J.
Booth Co., Arthur E., 4124 Beverly Blvd., Los Angeles 4, Calif.
Boots Aircraft Nut Corp., 50 John St., Stamford, Conn.
Borden Co., The Chemical Div., 350 Madison Ave., New York 17, N. Y.
Borthing Co., Inc., George C., P. O. Box 115, East Rutherford, N. J.
Boston Insulated Wire & Cable Co., 63 Bay St., Boston 25, Mass.
Bourn Instrument Corp., 65 Madison Avenue, New York 16, N. Y.
Bound Brook Oil-Less Bearing Co., Bound Brook, N. J.
Bowen & Co., Inc., 4712 Bethesda Ave., Bethesda, Md.
Bowers Battery & Spark Plug Co., Reading, Pa.
Bowser Inc., Refrigeration Div., Terryville, Conn.
Boyce R. T., 90 Montrose Ave., Buffalo 14, N. Y.
Brach Mfg. Corp., 200 Central Ave., Newark 4, N. J.
Brackley Labs., Inc., 62 Meadow St., New Haven 10, Conn.
Bradshaw Instruments Co., 348 Livingston St., Brooklyn 17, N. Y.
Brady Co., W. H., 615 N. Third St., Milwaukee 3, Wis.
Brainin Co., C. S., 320 Washington St., Mt. Vernon, N. Y.
Brand & Co., Wm. Willimantic, Conn.
Brandywine Fiber Co., 15th & Poplar Sts., Wilmington, Del.
Brannon Instruments, Inc., 418 Fairfield Ave., Stamford, Conn.
Brantton Electric Mfg. Co., Inc., 62-65 Gill Pl., Bronx 22, N. Y.
Breeze Corps., Inc., 41 S. Sixth St., Newark 7, N. J.
Breeze Electronics Corp., 55 Viaduct St., New York 13, N. Y.
Breen Laboratories, 1520 Evergreen Rd., Williamsport, Pa.
Bridgeport Brass Co., 30 Grand St., Bridgeport, Conn.
Bright Star Battery Co., 200 Crooks Ave., Clifton, N. J.
Brilliant Company, The, Granby, Conn.
Bristol Co., The, Waterbury 20, Conn.
Bristol Motor Co., Old Saybrook, Conn.
British Industries Corp., 164 Duane St., New York 13, N. Y.
Broadcasting Program Service, 23 W. 45th St., New York 19, N. Y.
Broadcast Electronics Lab., 1546 Second Ave., New York 28, N. Y.
Brockner Mast Instruments, Inc., 1546 Second Ave., New York 28, N. Y.
Brook Electronics, Inc., 34 Desbrosses Place, Elizabeth, N. J.
Brown-Bridge Mills, Inc., Troy, Ohio.
Brown Electro-Measurement Corp., 3617 SE Hawthorne Blvd., Portland 15, Ore.
Browning Laboratories, Inc., 750 Main St., Winchester, Mass.
Bruning Co., Inc., Charles, 4754 Montrose Ave., Chicago 41, Ill.
Brush Development Co., The, 4101 Chester Ave., Cleveland 14, Ohio.
Brush Development Company, The, 3405 Perkins Ave., Cleveland 14, Ohio.
Buchanan Electrical Products Corp., 1290 Central Ave., Hillside, N. J.
Buchmann Spark Wheel Corp., 4-20 47th Ave., Long Island City 1, N. Y.
Buck Engineering Co., 37-41 Mercy St., Freehold, N. J.
Buhl Radio, Inc., 2114 E. 55th St., Cleveland 3, Ohio.
Buhr Co., The, Harvey, Ill.
Bunnell & Co., H. M., 126 Stanton St., Toledo, Ohio.
Bush Optical Co., 1004 Beech Ave., Pittsburgh 12, Pa.
Bundy Tubing Co., 8109 E. Jefferson Ave., Detroit 14, Mich.
Bunnell and Co., J. H., 81 Prospect St., Brooklyn, N. Y.
Burgess Battery Co., Battery Div., Freeport, Ill.
Burke Electric Co., 12th & Cranberry Sts., Erie, Pa.
Burling Instrument Co., 253 Springfield Ave., Newark 3, N. J.
Burlington Instrument Co., Burlington, Iowa.
Burndy Engineering Co., Inc., 107 Bruckner Blvd., New York 54, N. Y.
Burnell & Co., 45 Warburton Ave., Yonkers 2, N. Y.
Burnett Radio Lab., Wm. W. L., 4814 Idaho St., San Diego, Calif.
Burnley Battery & Mfg. Co., Clay St., North East, Pa.
Bussmann Mfg. Co., St. Louis 7, Mo.

C.G.S. Laboratories, Inc., 36 Ludlow St., Stamford, Conn.
C-O-Two Fire Equipment Co., P. O. Box 390, U. S. Highway 1, Newark 1, N. J.
Caddell-Burns Mfg. Co., 480 Broome St., New York 13, N. Y.
Calbest Engineering & Electronics Co., 828 N. Highland Ave., Hollywood 38, Calif.
Caldyne Co., The, 751 Main St., Winchester, Mass.
Calfone Corp., 1041 N. Sycamore Ave., Hollywood 38, Calif.
Calron Co., 1406 So. Hobart Blvd., Los Angeles 6, Calif.
Cambridge Thermionic Corp., 445 Concord Ave., Cambridge, Mass.
Camburn Inc., 32-40 57th St., Woodside, N. Y.
Camera Equipment Co., 1600 Broadway, New York, N. Y.
Camloc Fastener Corp., 420 Lexington Ave., New York 17, N. Y.
Canadian Radium & Uranium Corp., 630 Fifth Ave., New York 20, N. Y.
Cannon Co., C. F., Springwater, N. Y.
Cannon Electric Development Co., 3209 Humboldt St., Los Angeles 31, Calif.
Canoga Corp., 14915 Bessemer St., P. O. Box 361, Van Nuys, Calif.
Capehart-Farnsworth Corp., Fort Wayne, Indiana.
Capps & Co., Inc., Frank L., 244 W. 49th St., New York 19, N. Y.
Carboloy Company Inc., 11139 E. Eight Mile Blvd., Detroit 32, Mich.
Carbonneau Industries, Inc., Grand Rapids, Mich.
Carborundum Co., The, Globar Div., Niagara Falls, N. Y.
Carby Mfg. Co., Inc., 62 Cottage Place, Waterbury 5, Conn.
Cardwell Mfg. Corp., Allen D., 97 Whiting St., Plainville, Conn.
Carnegie Illinois Steel Corp., U. S. Steel Corp. Sub., Carnegie Building, Pittsburgh, Pa.
Carnine & Bitter, 2332 Ontario Rd., NW, Washington 9, D. C.
Carol Cable Co., 190 Middle St., Pawtucket, R. I.
Carpenter Steel Co., Union, N. J.
Carpenter Steel Co., The, 142 West Bern St., Reading, Pa.
Carron Mfg. Co., 415 S. Aberdeen St., Chicago, Ill.
Carson Micrometer Corp., 2 E. Main St., Little Falls, N. J.
Carter Motor Co., 2646 N. Maplewood Ave., Chicago 47, Ill.
Carter Parts Co., 213 Institute Place, Chicago 10, Ill.
Cascade Television Co., 179 South St., Newark, N. J.
Castlewood Mfg. Co., 12th & Burnett Sts., Louisville, Ky.
Catalin Corp. of America, 1 Park Ave., New York 16, N. Y.
Celanese Corp. of America, 180 Madison Ave., New York 16, N. Y.
Celomat Corp., 521 W. 23rd St., New York, N. Y.
Central Paper Co., Inc., 2400 Lakeshore Drive, Muskegon, Michigan.
Central Scientific Co., 1700 Irving Park Rd., Chicago 13, Ill.
Central Screw Co., 3501 Shields Ave., Chicago 9, Ill.
Centralab, Div. of Globe Union Inc., 900 E. Keefe Ave., Milwaukee 1, Wis.
Century Electric Co., 1806 Pine St., St. Louis 3, Mo.
Century Geophysical Corp., 1333 North Utica, Tulsa, Oklahoma.
Cerro de Pasco Copper Corp., 40 Wall St., New York 5, N. Y.
Chase Co., W. M., 1600 Beard Ave., Detroit, Mich.
Chandler Products Co., 1491 Chardon Rd., Cleveland, Ohio.
Channel Master Co., Ellenville, N. Y.
Chase Brass & Copper Co., Inc., Waterbury 91, Conn.
Chaslyn Co., The, 1952 Irving Park Rd., Chicago 13, Ill.
Chatham Electronics Corp., 475 Washington St., Newark 2, N. J.
Chatten & Sons, John, 93 Cliff St., New York 7, N. Y.
Cherry Rivet Co., 231 Winston Street, Los Angeles 13, Calif.
Chester Cable Corp., Chester, N. Y.
Chicago Condenser Corp., 3255 W. Armitage Ave., Chicago 47, Ill.
Chicago Die Mold Mfg. Co., 4001 Wrightwood Ave., Chicago 39, Ill.
Chicago Expansion Bolt Co., 1338 W. Concord Pl., Chicago 22, Ill.
Chicago Metal Hose Corp., 1309 S. Third Ave., Maywood, Ill.
Chicago Rivet & Machine Co., 9600 W. Jackson Blvd., Chicago, Ill.
Chicago Telephone Supply Corp., 1142 W. Beardsley Ave., Elkhart, Ind.
Chicago Transformer Div., Essex Wire Corp., 3501 W. Addison St., Chicago 18, Ill.
Cima Corp., 91 Boylston St., Jamaica Plains 30, Mass.
Cinaudagraph Speakers Inc., Div. of Aireon Mfg. Corp., 1401 Fairfax Trafficway, Kansas City, Kansas.
Cinch Mfg. Corp., 1026 S. Homan Ave., Chicago 24, Ill.
Cinema Engineering Co., 1510 W. Verdugo Ave., Burbank, Calif.
Citation Products Co., 233 E. 146th St., New York 51, N. Y.
Clare & Co., C. P., 4719 Sunnyside Ave., Chicago 30, Ill.

Clarendon Glass Blowing Co., 272 Second St., Secaucus, N. J.
Clark Controller Co., 1146 E. 152nd St., Cleveland 10, Ohio.
Clark Crystal Co., 2 Farm Rd., Marlboro, Mass.
Clark Electronic Labs., Box 165, Palm Springs, Calif.
Clarke Instrument Corp., 910 King St., Silver Spring, Md.
Clarkstan Corp., 11927 SW. Pico Blvd., Los Angeles 64, Calif.
Clarostat Mfg. Co., Inc., Dover, N. H.
Clearprint Paper Co., 672 Folsom St., San Francisco, Calif.
Cleveland Container Co., The, 6201 Barberton Ave., Cleveland 2, Ohio.
Cleveland Electronics, Inc., 6611 Euclid Ave., Cleveland, Ohio.
Cleveland Tungsten, Inc., 10200 Meech Ave., Cleveland, Ohio.
Clippard Instrument Laboratory, Inc., 1125 Bank St., Cincinnati 14, Ohio.
Clough Brengle Co., 6014 N. Broadway, Chicago, Illinois.
Coastwise Electronics Co., Inc., 130 N. Beaudry Ave., Los Angeles, Calif.
Cohan-Epner Co., Inc., 142 W. 14th St., New York 11, N. Y.
Cohn Corp., Sigmund, 44 Gold St., New York, N. Y.
Coil Winders, Inc., 61 Berger St., Brooklyn 2, N. Y.
Coil-O-Matic Co., 470 Atlantic Ave., Boston 10, Mass.
Cole-Hersee Co., 20 Old Colony Ave., Boston 27, Mass.
Cole Instrument Co., 1320 S. Grand Ave., Los Angeles 15, Calif.
Cole Radio Works, 86 Westville Ave., Caldwell, N. J.
Coleman Instruments, Inc., 318 Madison St., Maywood, Illinois.
Collaite Mfg. Corp., Lindenhurst, L. I., N. Y.
Collins Audio Products Co., P. O. Box 306, Westfield, N. J.
Collins Radio Co., Cedar Rapids, Iowa.
Collyer Insulated Wire Co., 249 Roosevelt Ave., Pawtucket, R. I.
Colonial Insulator Co., The, 907 Grant St., Akron 11, Ohio.
Colonial Radio Corp., Box 2, Binghamton, N. Y.
Columbia Electric Mfg. Co., 4529 Hamilton Ave., N. E., Cleveland 14, Ohio.
Columbia Metal Box Co. Co., 260 E. 144th St., New York, N. Y.
Columbia Nut & Bolt Co., 944 Main St., Bridgeport 3, Conn.
Columbia Wire & Supply Co., 2850 Irving Park Rd., Chicago 18, Ill.
Comar Electric Co., 4148 N. Washtenaw Ave., Chicago 18, Ill.
Combustion Control Corp., 77 Broadway, Cambridge 42, Mass.
Combustion Research Laboratories, Inc., 104-18 Metropolitan Ave., Forest Hills, N. Y.
Commercial Equipment Co., Inc., Box 168, Lawrence, Kansas.
Commercial Radio Sound Corp., 571 Lexington Ave., New York 22, N. Y.
Commercial Research Labs, Inc., 20 Bartlett Ave., Detroit 3, Michigan.
Communication Accessories Co., Box 145, 110th St. & Holcrest Rd., Hickman Hills, Mo.
Communication Measurements Lab, Inc., 120 Greenwich St., New York, N. Y.
Communication Products Company, Inc., Broadway & Clark St., Keyport, N. J.
Communications Co., Inc., 800 Greco Ave., Coral Gables 34, Fla.
Conant Labs., 6500 "O" St., Lincoln 6, Nebraska.
Condenser Products Co., 1375 N. Branch St., Chicago 22, Ill.
Conn Ltd., C. G., Electronics Div., Elkhart, Ind.
Connecticut Hard Rubber Co., 407 East St., New Haven 9, Conn.
Connecticut Telephone & Electric Div., Great American Industries, 70 Brittania St., Meriden, Conn.
Consolidated Engineering Corp., 620 N. Lake Ave., Pasadena 4, Calif.
Consolidated Molded Products Corp., Scranton 2, Pa.
Consolidated Wire & Associated Companies, 1635 S. Clinton St., Chicago 16, Illinois.
Continental Carbon, Inc., 13900 Lorain Ave., Cleveland 11, Ohio.
Continental Diamond Fibre Co., 16 Chapel St., Newark 16, Delaware.
Continental Electric Co., Geneva, Ill.
Continental Electric Co., Inc., 334 Ferry St., Newark 5, N. J.
Continental Electronics Mfg. Co., 1728 Wood St., Dallas 1, Texas.
Continental Screw Co., New Bedford, Mass.
Control Corp., 718 Central Ave., Minneapolis 14, Minn.
Control Engineering Corp., 863 Washington St., Canton, Mass.
Cook Electric Co., 2700 Southport Ave., Chicago 14, Ill.
Cook Laboratories, 139 Gordon Blvd., Floral Park, N. Y.
Cooper Electronic Products Co., 5106 Frankford Ave., Philadelphia 24, Pa.
Copperweld Steel Co., Glassport, Pa.
Coral Designs, P. O. Box 246, Forest Hills, N. Y.
Corbin Screw Division, American Hardware Corp., High, Myrtle & Grove Sts., New Britain, Conn.
Cornell Dubilier Electric Corp., South Plainfield, N. J.
Corning Glass Works, Corning, N. Y.
Cornish Wire Co., 15 Park Row, New York 7, N. Y.
Corona Engineering Service, 94-52 Corona Ave., Elmhurst, N. Y.
Coronet Radio & Television Corp., 500 W. 52nd St., New York 19, N. Y.
Cosmic Radio Corp., 853 Whittier St., New York 59, N. Y.
Cossor (Canada) Ltd., 301-303 Windsor St., Halifax, N. S., Canada.
Coto-Coil Co., Inc., 65 Pavilion Ave., Providence 5, R. I.
Craft Mfg. Co., 3949 W. Schubert St., Chicago, Ill.
Cramer Co., Inc., R. W., Box 13, Centerbrook, Conn.
Crane Packing Co., 1800 Cuyler Ave., Chicago 13, Ill.
Crescent Industries, Inc., 4140 Belmont Ave., Chicago 41, Ill.
Crest Transformer Corp., 1834-36 W. North Ave., Chicago 22, Ill.
Crestwood Recorder Corp., 624 W. Adams, Chicago 6, Ill.
Cruname, Inc., 3701 Ravenswood Ave., Chicago, Ill.
Crosley Div., Avco Mfg. Corp., Cincinnati 25, Ohio.
Cross Co., H., 15 Beekman St., New York, N. Y.
Crowley & Co. Inc., Henry L., 1 Central Ave., West Orange, N. J.
Crown Capacitor Corp., Minot & Depot Sts., Wrentham, Mass.
Crucible Steel Co. of America, 405 Lexington Ave., New York 17, N. Y.
Crystal Research Labs, Inc., 29 Allyn St., Hartford, Conn.
Curtis Development and Mfg. Co., 1 N. Crawford Ave., Chicago 24, Ill.
Custom Craft Mfg. Co., 256 E. 98th St., Brooklyn, N. Y.
Cutler Metal Products Co., Camden, N. J.
Cutler-Hammer, Inc., 411 No. 12th St., Milwaukee 1, Wis.
Cyclamosa Spring Co., 10272 Berea Rd., Cleveland, Ohio.
Cycle Electronic Laboratories, 14 Northfield Ave., West Orange, N. J.
Cyclohm Motor Corp., Div., Howard Industries, Inc., Racine, Wis.
Cyclotron Specialties Co., Moraga 8, Calif.

DX Radio Products Co., Inc., 2304 Armitage Ave., Chicago 47, Ill.
Dalbow Labs., 5066 Santa Monica Blvd., Los Angeles, Calif.
Dalmo Victor Co., 1414 El Camino Real, San Carlos, Calif.
Dane Electric Co., Main St., Winsted, Conn.
Dante Electric Mfg. Co., Bantam, Conn.
Daven Co., 191 Central Ave., Newark 4, N. J.
Davies Laboratories, Inc., 4705 Queensbury Rd., Riverdale, Md.
Davis & Co., Dean W., Kentland, Ind.
Davis Electric Co., Cape Girardeau, Mo.
Dayco Radio Corp., 915 Valley St., Dayton 4, Ohio.
Decca Records, Inc., 50 W. 57th St., New York 19, N. Y.
Decimeter, Inc., 1440 Market St., Denver 2, Colorado.
De Courtney Engineering Lab., P. O. Box 255, Los Angeles 25, Calif.
Deitz Co., S. J., Box 65, W. Englewood, N. J.
Deitz Miracle Lens Co., 141 President St., Passaic, N. J.
DeJur-Amsco Corp., Northern Blvd. at 45th St., Long Island City 1, N. Y.
De Laval Separator Co., 165 Broadway, New York 6, N. Y.
Delco Appliance Div., General Motors Corp., 391 Lyell Ave., Rochester, N. Y.
Delco Radio Div., General Motors Corp., Kokomo, Ind.
Delmhorst Instrument Co., 115 Cornelia St., Boonton, N. J.
Designers for Industry, Inc., 2915 Detroit Ave., Cleveland 13, Ohio.
Deutschmann Corp., Tobe, 921 Providence Highway, Norwood, Mass.
DeWald Radio Mfg. Corp., 35-15 37th Ave., Long Island City, N. Y.
Dial Light Co. of America, Inc., 900 Broadway, New York 3, N. Y.
Diamond Drill Carbon Co., 53-63 Park Row, New York 7, N. Y.
Diamond Mfg. Co., Wakefield, Mass.
Diamond Wire & Cable Co., Sycamore, Ill.
Dictaphone Corp., 420 Lexington Ave., New York 17, N. Y.
Diehl Manufacturing Co., 1129 Finderne Ave., Somerville, N. J.
Dielectric Materials Co., 5315-17 N. Ravenswood Ave., Chicago 40, Ill.
Dielectric Products Co., Inc., 125 Virginia Ave., Jersey City 5, N. J.
Dietz Design & Mfg. Co., 5810 Park Ave., Kansas City 4, Mo.
Dietzgen Co., Eugene, 2425 Sheffield Ave., Chicago, Ill.
Dilks Co., The, Seymour, Conn.
Dillon & Co., Inc., W. C., 5410 W. Harrison St., Chicago 44, Ill.
Dimco-Gray Co., 207 E. Sixth St., Dayton, Ohio.
Dimon Coil Co., Inc., Caledonia, N. Y.
Distillation Products Industries, Vacuum Equip. Div., 755 Ridge Rd. W., Rochester 8, N. Y.
Division Lead Co., 836 W. Kinzie St., Chicago 22, Ill.
Dixon Crucible Co., Joseph, Jersey City, N. J.
Dobeckmun Co., The, Industrial Products Div., Cleveland 1, Ohio.
Dolph Co., John C., Monmouth Junction, N. J.
Donnelly Electric & Mfg. Co., 3050 Washington St., Boston, Mass.
Doolittle Radio, Inc., 7421 S. Loomis Blvd., Chicago 36, Ill.
Dormitzer Electric & Mfg. Co., Inc., 89 Brighton Ave., Boston 34, Mass.
Douglas Radio Labs., 40 Wayland St., Boston 25, Mass.
Dow Chemical Co., Midland, Mich.
Dow Corning Corp., Midland, Mich.
Drake Electric Works, 3656 Lincoln Ave., Chicago 13, Ill.
Drake Mfg. Co., 1713 Hubbard St., Chicago, Ill.
Dresser Electric Co., 942 E. Larned St., Detroit 7, Mich.
Driver Co., Wilbur B., 150 Riverside Ave., Newark 4, N. J.
Driver-Harris Co., 201 Middlesex St., Harrison, N. J.
Dual Remote Control Co., Garden City, Mich.
Dumont Electric Co., 308 Dyckman St., New York, N. Y.
DuMont Laboratories, Inc., Allen B., Electronic Parts Div., Market St., East Paterson, N. J.
DuMont Laboratories, Inc., Allen B., Instrument Div., 1000 Main Ave., Clifton, N. J.
DuMont Laboratories, Inc., Allen B., Television Receiver Div., Market St., East Paterson, N. J.
DuMont Laboratories, Inc., Allen B., Television Transmitter Div., 1000 Main Ave., Clifton, N. J.
DuMont Laboratories, Inc., Allen B., Tube Div. & General Offices, 750 Bloomfield Ave., Clifton, N. J.
Dumore Co., The, 1300 Seventeenth St., Racine, Wis.
Dustone Co., Keyport, N. J.
du Pont de Nemours & Co., Inc., E. I., Wilmington, Del.
du Pont de Nemours & Co., Inc., E. I., Patterson Screen Div., Towanda, Pa.
Durakool, Inc., 1010 N. Main St., Elkhart, Ind.
Durez Plastics & Chemicals, Inc., 1921 Walck Rd., North Tonawanda, N. Y.
Dynamic Air Engineering Inc., 1619 S. Alameda St., Los Angeles, Calif.
Dzus Fastener Co., Inc., Box 785, Babylon, N. Y.

Eagle Electric Mfg. Co., Inc., 23-10 Bridge Plaza S., Long Island City, N. Y.
Eagle Pencil Co., 703 E. 13th St., New York, N. Y.
Eagle Signal Corp., Moline, Ill.
Eastern Air Devices Inc., 585 Dean St., Brooklyn 17, N. Y.
Eastern Case Co., 55 S. 11th St., Brooklyn 11, N. Y.
Eastern Metals Industries, 250 W. 54th St., New York 19, N. Y.
Eastern Mike Stand Co., 56 Christopher Ave., Brooklyn 12, N. Y.
Eastern Smelting & Refining Corp., 107-109 W. Brookline St., Boston 18, Mass.
Eastern Specialty Co., Philadelphia 40, Pa.
Eastman Kodak Co., Industrial Photographic Sales Div., 343 State St., Rochester 4, N. Y.
Easy Up Tower Co., 3800 Kinzie Ave., Racine, Wis.
Eberhard Faber Pencil Co., 37 Greenpoint Ave., Brooklyn 22, N. Y.
Eberle Electronics Corp., 185-09 Jamaica Ave., Hollis 9, N. Y.
Eby, Inc., Hugh H., 4700 Stenton Ave., Philadelphia 44, Pa.
Echo High Frequency Corp., 7020 Hudson Blvd., North Bergen, N. J.
Eckert-Mauchly Computer Corp., 3747 Ridge Ave., Philadelphia 32, Pa.
Eclaireur Radio & Television Co., Le Roy, Minn.
Edcliff Pioneer Div., Bendix Aviation Corp., Teterboro, N. J.
Economy Fuse & Mfg. Co., 2717 Greenview Ave., Chicago 14, Ill.
Eden Electronics Co., 207 Main St., Worcester, Mass.
Edison, Inc., Thomas A., 51 Lakeside Ave., West Orange, N. J.
Edison, Inc., Thomas A., Instrument Div., West Orange, N. J.
Edison Storage Battery Div. of Thomas A. Edison, Inc., Main St. at Lakeside Ave., W. Orange, N. J.
Edo Corp., College Point, Long Island, N. Y.
Egyptian Lacquer Mfg. Co., Lafayette, Ind.
Eicor, Inc., 1501 W. Congress St., Chicago 7, Ill.
Eidson Electronic Co., 1802 N. Third St., Temple, Texas.
Eisler Engineering Co., Inc., 740 S. 13th St., Newark 3, N. J.
Eitel-McCullough, Inc., San Bruno, Calif.
Elastic Stop Nut Corp., 2330 Vauxhall Rd., Union, N. J.
Elco Mfg. Co. Div. of Electro-Connector Corp., 110 W. Oxford St., Phila. 22, Pa.
Electran Mfg. Co., 4546 Elston Ave., Chicago 30, Ill.
Electric Auto-Lite Co., The, Toledo 1, Ohio.
Electric Design & Mfg. Corp., Burlington, Iowa.
Electric Eye Equipment Co., 16 W. Fairchild St., Danville, Ill.
Electric Heat Control Co., The, 9123 Inman Ave., Cleveland 5, Ohio.
Electric Indicator Co., 21 Parker Ave., Stamford, Conn.
Electric Motor Corp. Div., Howard Industries, Inc., Racine, Wis.
Electric Products Co., 1725 Clarkstone Rd., Cleveland, 12, Ohio.
Electric Regulator Corp., 1938 Park Ave., New York 35, N. Y.
Electric Soldering Iron Co., W. Elm St., Deep River, Conn.
Electric Specialty Co., 211 South St., Stamford, Conn.
Electric Storage Battery Co., Allegheny Ave., & 19th St., Philadelphia 32, Pa.
Electric Tachometer Corp., 2218 Vine St., Philadelphia, 3, Pa.
Electrical Coil Winding Co., 2733 Saunders St., Camden, N. J.
Electrical Industries, Inc., 44 Summer Ave., Newark 4, N. J.
Electrical Reactance Corp., Elm St., Franklinville, N. Y.
Electrical Refractories Co., 50 Clark St., East Palestine, Ohio.
Electrical Windings, Inc., 2015 N. Kolmar Ave., Chicago 39, Ill.
Electrical Transformer Co., Westerly Rd., Ossining, N. Y.
Electro Aire, Inc., 11439 Vanowen St., North Hollywood, Calif.
Electro Engineering & Mfg. Co., 627 W. Alexandrine, Detroit 1, Mich.
Electro Engineering Works, 6021 College Ave., Oakland 18, Calif.
Electro-Mechanical Instrument Co., 812 Chestnut St., Perkasie, Pa.
Electro-Mechanical Research, Inc., Ridgefield, Conn.
Electro-Medical Lab., Inc., Hollis ton, Mass.
Electro Metallurgical Division, Union Carbide and Carbon Corp., 30 E. 42nd St., New York 17, N. Y.

Electro Motive Mfg. Co., South Park & John St., Willimantic, Conn.
Electro-Nite Carbon Co., 1133 E. Columbia Ave., Phila. 25, Pa.
Electro Products Labs., 549 W. Randolph St., Chicago 6, Ill.
Electro-Seal Corp., 946 Lee St., Des Plaines, Ill.
Electro Tec Corp., 53 Bergen Turnpike, Little Ferry, N. J.
Electro-Voice, Inc., Buchanan, Mich.
Electro-Wire Service, 5 Beekman St., New York 7, N. Y.
Electrodyne Company, 32 Oliver St., Boston, Mass.
Electroflex Corp., 30 Butts Ave., New Canaan, Conn.
Electron Equipment Corp., 917 Meridian Ave., South Pasadena, Calif.
Electronic Associates, Inc., Long Branch, N. J.
Electronic Batteries Inc., Bush Terminal Bldg. No. 4, 28-94 35th St., Brooklyn 32, N. Y.
Electronic Brazing Co., 149 Glenridge Ave., Montclair, N. J.
Electronic Coils, Inc., P. O. Box 1641, 44 Taylor St., Springfield, Mass.
Electronic Control Corp., 1523 E. Forest St., Detroit, Mich.
Electronic Controls Co. of New York, 3124 Avenue J, Brooklyn 10, N. Y.
Electronic Designs, Inc., Irvington, N. Y.
Electronic Engineering Co., 616 G St., San Diego 1, Calif.
Electronic Engineering Corp., 624 Ridge Rd., Lyndhurst, N. J.
Electronic Enterprises, Inc., 65 7th Ave., Newark 4, N. J.
Electronic Equipment & Instrument Co., Inc., 23 S. Arch St., Philadelphia 3, Pa.
Electronic Indicator Corp., 53 Wyckoff St., Brooklyn, N. Y.
Electronic Instrument Co., Inc., 276 Newport St., Brooklyn 12, N. Y.
Electronic Mfg. Co., 20 Orange St., Newark, N. J.
Electronic Measurements Co., Red Bank, N. J.
Electronic Measurements Corp., 423 Broome St., New York 13, N. Y.
Electronic Mechanical Products Co., 13-15-17 N. Virginia Ave., Atlantic City, N. J.
Electronic Mechanics, Inc., 70 Clifton Blvd., Clifton, N. J.
Electronic Processes Corp., 260 N. First St., San Jose 10, Calif.
Electronic Products Co., 111 E. 3rd St., Mt. Vernon, N. Y.
Electronic Products Div., Epco Products, Inc., 2450 Atlantic Ave., Brooklyn 33, N. Y.
Electronic Rectifier Inc., 733 N. East St., Indianapolis, Ind.
Electronic Specialty Co., 5456 Glendale Blvd., Los Angeles 39, Calif.
Electronic Transformer Co., Inc., 215 W. 20th St., New York, N. Y.
Electronic Tube Corp., 1200 E. Mermaid Ave., Philadelphia 18, Pa.
Electronic Workshop, Inc., 351 Bleecker St., New York 14, N. Y.
Electrons, Inc., 137 Sussex Ave., Newark 4, N. J.
Electronix Co., Inc., 60 Franklin St., East Orange, N. J.
Electryme Motor Products Corp., 565 W. Washington Blvd., Chicago 6, Ill.
Elliott Mfg. Co., 218 Prospect Ave., Binghamton, N. Y.
Elly Associates, Box 77, Pelham 65, N. Y.
Elm Laboratories, 19 South Broadway, Dobbs Ferry, N. Y.
Elpar Co., 5149 Market St., Camden 2, N. J.
Elton Inc., 407 N. Jackson St., Jackson, Mich.
E. Francis, Inc., 2649 No. Howard St., Philadelphia 33, Pa.
Embassy Engineering Corp., 224 E. 204th St., New York 58, N. Y.
Emerald Co., Inc., The, 1239 Central Ave., Hillside 5, N. J.
Emerson Radio & Phonograph Corp., 111 8th Ave., New York, N. Y.
Empire Coil Co., Inc., 210 Huguenot St., New Rochelle, N. Y.
Engineering Co., 27 Wright St., Newark, N. J.
Engineering Lab., Inc., 602 E. 4th St., Tulsa 4, Okla.
Engineering Research Associates, Inc., 1902 W. Minnehaha Ave., St. Paul 4, Minn.
Engineering Research Corp., Stevenson, Ld.
Engineers Specialties Div., Universal Engraving & Color Co., 2900 Elliott St., Buffalo 4, N. Y.
Englewood Electrical Supply Co., 1401 S. Halsted St., Chicago, Ill.
Enthoven & Sons Ltd., H. J., London, England
Epsilon Lab., Inc., The, Newport, R. I.
Eraser Co., Inc., The, Push Wire Stripper Div., 104 S. State St., Syracuse 2, N. Y.
Erco Radio Labs., Inc., East Stewart Ave., Lyndhurst, N. J.
Ericsson Screw Machine Products Co., 25 Lafayette St., Brooklyn 1, N. Y.
Erie Resistor Corp., 644 W. 12th St., Erie, Pa.
Essex Mfg. Co., Inc., 528 E. 72nd St., New York, N. Y.
Esse Electronics Corp., Dawson, 11741 W. Pico Blvd., Los Angeles 34, Calif.
Est Instrument Co., Inc., 96 So. Washington Ave., Bergenfield, N. J.
Esser, Maurice H., 113 N. Water St., Rochester 4, N. Y.
Essex Electronics, Berkley Heights, N. J.
Essex Wire Corp., Hackettstown, N. J.
Essex Wire Corp., 1601 Wall St., Fort Wayne 4, Ind.
Estabrook Angel Co., P. O. Box 596, Indianapolis 6, Ind.
Etched Products Corp., 39-01 Queens Blvd., Long Island City, N. Y.
Etnaco Mfg. Co., Inc., Woods Church Rd., Framingham, N. J.
Eureka Television & Tube Corp., 69 47th Ave., New Haven, N. J.
Eutectic Welding Alloys Corp., 40 Worth St., New York 13, N. Y.
Evemstone, Inc., 415 Lexington Ave., New York 17, N. Y.
Eyelet Tool Co., 188 Dorchester Ave., Boston, Mass.

Fada Radio & Electric Co., Inc., 525 Main St., Belleville, N. J.
Fafnir Bearing Co., Booth St., New Britain, Conn.
Fairchild Camera & Instrument Corp., 88-06 Van Wyck Blvd., Jamaica 1, N. Y.
Fairchild Recording Equipment Corp., 154th St. & 7th Ave., Whitestone, N. Y.
Fairstrom Co., 44 Fairstrom Court, Passaic, N. J.
Fansteel Metallurgical Corp., 2200 Sheridan Rd., North Chicago, Ill.
Farrand Optical Co., Inc., Bronx Blvd. at 238th St., New York 66, N. Y.
Farrenloy Co., 1245 N. 26th St., Philadelphia 21, Pa.
Fasco Industries, Inc., Rochester 2, N. Y.
Fast & Co., John E., 3101 N. Pulaski Rd., Chicago 41, Ill.
Federal Electric Products Co., 50 Paris St., Newark, N. J.
Federal Engineering Co., 37 Murray St., New York 7, N. Y.
Federal Instrument Corp., 14-02 Broadway, L. I. City 2, N. Y.
Federal Screw Products Inc., 224 W. Huron St., Chicago 10, Ill.
Federal Telecommunication Labs., Inc., 500 Washington Ave., Nutley 10, N. J.
Federal Telephone and Radio Corp., 100 Kingsland Rd., Clifton, N. J.
Federal Television Corp., 137-9-41 Duane St., New York 13, N. Y.
Federal Wire & Cable Corp., Haverstraw, N. Y.
Federated Metals Div., American Smelting & Refining Co., 120 Broadway, New York 5, N. Y.
Feiler Engineering Co., 1601 S. Federal St., Chicago 16, Ill.
Felsenthal & Sons, Inc., G., 4100 W. Grand Ave., Chicago 51, Ill.
Felt Products Mfg. Co., 1504 W. Carroll Ave., Chicago 7, Ill.
Felters Co., The, 210 South St., Boston, Mass.
Fenwall, Inc., 43A Pleasant St., Ashland, Mass.
Fenner Co., R. Y., 110 Pleasant St., Malden, Mass.
Ferranti Electric, Inc., 30 Rockefeller Plaza, New York, New York 20, N. Y.
Ferris Instrument Co., 110 Cornelia St., Boonton, N. J.
Fidelitone Inc., 1616 Devon Ave., Chicago 26, Ill.
Fidelity Amplifier Co., 703 Willow St., Chicago 14, Ill.
Fidelity Chemical Products Corp., 472 Frelinghuysen Ave., Newark, N. J.
Field Electrical Instrument Co., 109 E. 184th St., New York 53, N. Y.
Finsbee Electronics Inc., 1171 New York Ave., Huntington Station, N. Y.
Fischer Co., Inc., The, 38-25 Bell Blvd., Bayside, Long Island, N. Y.
Fisch Telecommunications, Inc., Passaic, N. J.
Fischer & Porter Co., Hatboro, Pa.
Fisher-Pierce Co., 70 Ceylon St., Boston 21, Mass.
Fisher Radio Corp., 41 East 47th Street, New York, N. Y.
Fisher Research Lab., 1961 University Ave., Palo Alto, Calif.
Fisher Scientific Co., 717 Forbes St., Pittsburgh 19, Pa.
Fiske, Inc., Frederic, North Tonawanda, N. Y.
Flexo Wire Co., Inc., 70 W. First St., Bayonne, N. Y.
Flight Research Engineering Corp., P. O. Box 1-F, Richmond 1, Va.
Flake Engineering Co., John, Box 755, Springdale, Conn.
Flush Wall Radio Co., 9 W. Park St., Newark 2, N. J.
Follansbee Steel Co., 3rd & Liberty Sts., Pittsburgh 30, Pa.
Foote Brothers Gear & Machine Corp., 4545 S. Western Blvd., Chicago 9, Ill.
Foote Mineral Co., 18 W. Chelten Ave., Philadelphia 44, Pa.
Ford Engineering Co., 2758 Colorado Blvd., Los Angeles 41, Calif.
Ford Instrument Co., Inc., 31-10 Thomson Ave., Long Island City, N. Y.
Ford Radio & Mica Corp., 516 63rd St., Brooklyn, N. Y.
Fordham Mfg. Co., 2220 Pearsall Ave., New York 67, N. Y.
Foredom Electric Co., 37 Park Place, New York 7, N. Y.
Formica Co., The, 4640 Spring Grove Ave., Cincinnati 32, Ohio
Fort, Niner Co., 5345 Grand River, Detroit 8, Mich.
Foster Transformer Co., Inc., 3820 Colerain Ave., Cincinnati 23, Ohio
Fostoria Pressed Steel Corp., Fostoria, Ohio
Fox Valley Instrument Co., Ingleside, Ill.
Foxboro Co., The, Foxboro, Mass.
Foxboro Co., The, Foxboro, Mass.
Foxboro Co., The, Foxboro, Mass

Goslin Electric and Manufacturing Co., 2921 W. Olive St., Burbank, Calif.
Gothard Mfg. Co., 2110 Clear Lake Ave., Springfield, Ill.
Gould Storage Battery Corp., 35 Neoga St., DePew, N. Y.
Gow-Mac Instrument Co., 22 Lawrence St., Newark 5, N. J.
Grady Instrument Co., 689 Belmont St., Belmont 78, Mass.
Grafo Colloids Corp., Sharon, Pa.
Gramer Company, The, 2734 N. Pulaski Rd., Chicago 39, Ill.
Grammes & Sons, Inc., L. F., 389 Union St., Allentown 2, Pa.
Grant Pulley & Hardware Co., 57th St. and Broadway, Woodside, L. I., N. Y.
Graphite Metallizing Corp., 1041 Nepperhan Ave., Yonkers 3, N. Y.
Grass Instrument Co., 101 Old Colony Ave., Quincy, Mass.
Gray Mfg. Co., The, 16 Arbor St., Hartford, Conn.
Gray Radio Co., 501 Forest Hill Blvd., W. Palm Beach, Fla.
Gray Research & Development Co., 16 Arbor St., Hartford 1, Conn.
Grayhill, 4524 W. Madison St., Chicago 24, Ill.
Great Lakes Electric Mfg. Co., 17 S. Desplaines St., Chicago 6, Ill.
Green Electric Co., W., 130 Cedar St., New York, N. Y.
Green Instrument Co., 385 Putnam Ave., Cambridge, Mass.
Greene Mfg. Corp., G. G., Warren, Pa.
Greenout Insulation Co., 31 W. 21st St., New York 10, N. Y.
Gregory Mfg. Co., Inc., The, 67 Franklin St., New Haven 11, Conn.
Greylin Co., Box 258, Chicago 90, Ill.
Gries Reproducer Corp., 100 Willow Ave., New York 54, N. Y.
Grigsby Allison Co., Inc., 407 N. Salem Ave., Arlington Heights, Ill.
Guardian Electric Mfg. Co., 1621 W. Walnut St., Chicago 12, Ill.
Guardian Electronics Corp., 614 W. 51st St., New York 19, N. Y.
Gulton Mfg. Corp., Metuchen, N. J.
Guthman, Inc., Edwin T., 15 S. Throop St., Chicago, Ill.

Haberland Mfg. Co., P. O. Box 476, Passaic, N. J.
Haft & Sons, Inc., 79 Third St., Brooklyn 31, N. Y.
Hagen Mfg. Co., Inc., Baraboo, Wis.
Hague & Co., Inc., Alfred, 227 34th St., Brooklyn, N. Y.
Halldorson Co., The, 4500 Ravenswood Ave., Chicago 40, Ill.
Hallett Mfg. Co., 1601 Florence Ave., Inglewood, Calif.
Hallicrafters Co., 4401 W. Fifth Ave., Chicago 24, Ill.
Haloid Co., The, 6 Haloid St., Rochester, N. Y.
Haltemax Products Division, Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y.
Hammarlund Mfg. Co., 460 W. 34th St., New York 1, N. Y.
Hamilton Kent Mfg. Co., Kent, Ohio.
Handy & Harman, 82 Fulton St., New York 7, N. Y.
Hanover Developments, 401 E. 74th St., New York 21, N. Y.
Hanovia Chemical & Mfg. Co., 233 N. J. R.R. Ave., Newark, N. J.
Hansen Mfg. Co., Inc., Princeton, Ind.
Harbauck Hindle, Inc., 40 Hermon St., Newark 5, N. J.
Harnett Electric Corp., 138 Haven Ave., Port Washington, L. I., N. Y.
Harper Co., The, H. M., 8200 Lehigh Ave., Morton Grove, Ill.
Harshaw Scientific Div. of The Harshaw Chemical Co., 1945 E. 97th St., Cleveland 6, Ohio.
Hart & Co., Inc., Frederick, 634 Main Ave., Passaic, N. Y.
Hart Mfg. Co., 110 Bartholomew Ave., Hartford 1, Conn.
Hartley Co., 145 H. A., 152 Hammersmith Rd., London W. 4, England.
Harvey Radio Labs., Inc., 447 Concord Ave., Cambridge, Mass.
Harvill Weilly Electronics, Inc., North St., Southbridge, Mass.
Hassall, Inc., John, Clay and Oakland Sts., Brooklyn, N. Y.
Hastings Instrument Co., Box 1275, Hampton, Va.
Hathaway Instrument Co., 1315 S. Clarkson St., Denver 10, Colo.
Hawley Products Co., St. Charles, Ill.
Hayden Mfg. Co., Inc., 584 E. Elm St., Torrington, Conn.
Hayden Co., A. W., The, 232 N. Elm St., Waterbury, Conn.
Haydu Brothers, Plainfield, N. J.
Haynes Labs., Inc., C. W., 61 Chandler St., Springfield, Mass.
Haynes Stellite Division, Union Carbide & Carbon Corp., Kokomo, Ind.
Hazard Insulated Wire Works Div., The Okonite Co., Wilkes Barre, Pa.
Heath Co., Benton Harbor, Mich.
Heiland Research Corp., 130 E. 5th Ave., Denver 9, Colo.
Heinemann Electric Co., 97 Plum St., Trenton 2, N. J.
Heintz & Kaufman Div. of The Robert Dollar Co., 947 Broadway, Redwood City, Calif.
Heller Bushing & Terminal Co., Inc., P. O. Box 91, Orange, N. J.
Hell-Coil Corp., 47-23 36th St., Long Island City 1, N. Y.
Helipot Corp., 916 Meridian Ave., So. Pasadena, Calif.
Helser Co., Gerald K., 1540 Ridgely St., Baltimore 30, Md.
Helwig Co., 2544 N. 30th St., Milwaukee 10, Wis.
Hercules Electric & Mfg. Co., Inc., 2500 Atlantic Ave., Brooklyn 7, N. Y.
Hercules Powder Co., Inc., 900 Market St., Wilmington 99, Del.
Herlec Corp., The, 422 N. Fifth St., Milwaukee 3, Wisc.
Hermaseal Co., The, Riverside Drive, Elkhart, Ind.
Hermetic Seal Products Co., 29-37 South 6th St., Newark 7, N. J.
Hertner Electric Co., 12690 Elmwood Ave., Cleveland 11, Ohio.
Herzog Miniature Lamp Works, Inc., 12-23 Jackson Ave., Long Island City 1, N. Y.
Hetherington, Inc., Sharon Hill, Pa.
Hewlett-Packard Co., 395 Page Mill Rd., Palo Alto, Calif.
Hexacon Electric Co., 130 W. Clay Ave., Roselle Park, N. J.
Heyman Mfg. Co., 300 Michigan Ave., Kenilworth, N. J.
Hickok Electrical Instrument Co., 10514 Dupont Ave., Cleveland, Ohio.
Hilborn Electronic Products Co., 55 Nassau Ave., Brooklyn 22, N. Y.
Hi-Par Products Co., Fitchburgh, Mass.
High Frequency Heating Co., 143 Glen Park Ave., Gary, Indiana.
High Voltage Engineering Corp., 7 University Rd., Cambridge 39, Mass.
Highland Engineering Co., 32 Hulman Blvd., Hicksville, N. Y.
Hillside Spinning & Stamping Co., Inc., 1429 Chestnut Ave., Hillside, N. J.
Hoffman Engineering Corp., Anoka, Minn.
Hoffman Radio Corp., 3716 S. Hill Street, Los Angeles 7, Calif.
Hofmann Corp., C. L., 436 Blvd. of the Allies, Pittsburgh 19, Pa.
Hogan Laboratories, Inc., 155 Perry St., New York 14, N. Y.
Hall Audio Industries, Hollywood Station Box 1230, Hollywood 28, Calif.
Hollingsworth & Vose Co., East Walpole, Mass.
Hollinston Mills, Inc., Norwood, Mass.
Holtzer-Cabot, Div. of National Pneumatic Co., Inc., 125 Amory St., Boston 19, Mass.
Home Recording Products Corp., Freeport, L. I., N. Y.
Homelite Corp., Port Chester, N. Y.
Hopp Press Inc., 460 W. 34th St., New York, N. Y.
Horn Co., Inc., A. C., 10th St. & 44th Ave., Long Island City 1, N. Y.
Horton Machine Products Co., Horton & Rockaway Aves., Valley Stream, N. Y.
Hose-McCann Telephone Co., Inc., 25th St. & 3rd Ave., Brooklyn 32, N. Y.
Houlton Company, T. J., 2508-14 W. Lawrence Avenue, Chicago 25, Illinois.
Howe of Television, 40 W. 4th St., New York 12, N. Y.
Hovis Screwlock Co., 8100 E. Nine Mile Rd., Van Dyke, Mich.
Howard Co., The, 934 Argyle Rd., Drexel Hill, Pa.
Howard Mfg. Corp., 1401 S. Main, Council Bluffs, Iowa.
Hubbard Spring Co., M. D., Central Ave., Pontiac, Mich.
Hubbell, Inc., Harvey, Bridgeport 2, Conn.
Hudson Wire Co., Winsted Div., Winsted, Conn.
Huggins Laboratories, 734 Hamilton Ave., Menlo Park, Calif.
Hunt Corp., The, 455 Lincoln St., Carlisle, Pa.
Hunter Photo Copyist Co., 566 Spencer St., Syracuse, N. Y.
Hunter Spring Co., Lansdale, Pa.
Hunton Plastics Co., 178 S. Van Brunt St., Englewood, N. J.
Huse Liberty Mica Co., 171 Camden St., Boston, Mass.
Hylor Co., 11423 Vanowen St., North Hollywood, Calif.
Hydraulic Press Mfg. Co., Mt. Gilead, Ohio.
Hy Lite Antennae Inc., 1060 Washington Ave., Bronx 56, N. Y.
Hytron Radio & Electronics Corp., 76 Lafayette St., Salem, Mass.

I-T-E Circuit Breaker Co., 19th & Hamilton Sts., Philadelphia 30, Pa.
Ideal Industries, Inc., Park & Borden Avenues, Sycamore, Ill.
Ilg Electric Ventilating Co., 2850 N. Crawford Ave., Chicago 41, Ill.
Illinois Condenser Co., 1616 N. Throop St., Chicago 22, Ill.
Illinois Testing Labs., Inc., 420 N. La Salle Street, Chicago 10, Ill.
Illinois Wood Products Corp., 1656 No. Besly Court, Chicago 22, Ill.
Ilsco Copper Tube & Products Inc., Mariemont Ave., Mariemont, Cincinnati 27, Ohio.
Indiana Steel Products Company, The, Valparaiso, Indiana.
Indiana Steel & Wire Co., 700 S. Council St., Muncie, Ind.
Induction Heating Corp., 181 Wythe Ave., Brooklyn 11, N. Y.
Inductive Equipment Co., Gettysburg, Pa.
Inductograph Laboratory, Box 76, Brookfield, Conn.
Inductograph Products, 236 W. 55th St., New York, N. Y.
Industrial Condenser Corp., 3243 N. California Ave., Chicago 18, Ill.
Industrial Control Co., 1462 Undercliff Ave., New York 52, N. Y.
Industrial Devices Inc., 22 State Rd., Edgewater, N. J.
Industrial Electrical Works, 1509 Chicago St., Omaha 2, Nebraska.
Industrial Electronics Co., Inc., Hanover, Mass.
Industrial Electronics, Inc., 2457 Woodward Ave., Detroit 1, Mich.
Industrial Instruments Inc., 17 Pollack Ave., Jersey City 5, N. J.
Industrial Precision Products Co., 315-325 N. Hoyne Ave., Chicago 12, Ill.
Industrial Synthetics Corp., 225 North Ave., Garwood, N. J.
Industrial Tape Corp., New Brunswick, N. J.
Industrial Timer Corp., 115 Edison Pl., Newark 5, N. J.
Insl-X Co., Inc., The, Water St. & Broadway, Ossining, N. Y.
Instrument Development Laboratories, Inc., Needham Heights, Mass.
Instrument Electronics, 42-17A Douglaston Parkway, Douglaston, L. I., N. Y.
Instrument Laboratories, 315 W. Walton Place, Chicago 10, Ill.
Instrument Parts Corp., P. O. Box 150, Ossining, N. Y.
Instrument Resistors Co., 1036 Commerse Ave., Union, N. J.
Instrument Specialties Co., Inc., 254 Bergen Blvd., Little Falls, N. J.
Insulstone Co., 1 Broadway, New York, N. Y.
Insulating Fabricators, Inc., 150 Union Ave., East Rutherford, N. J.
Insulating Fabricators of New England, Inc., 69 Grove St., Watertown 72, Mass.
Insulating Tube Co., 26 Cottage St., P. O. Box 1, Poughkeepsie, N. Y.
Insulation Mfg. Co., 11 New York Ave., Brooklyn, New York.
Insulation Manufacturers Corp., 565 W. Washington Blvd., Chicago 6, Ill.
Insurance Corp. of America, 36-02 35th Avenue, Long Island City, N. Y.
International Derrick & Equipment Co., 875 Michigan Ave., Columbus 8, Ohio.
International Instruments, Inc., 331 East St., New Haven 11, Conn.
International Machine Works, 6904 Madison St., Guttenberg, N. J.
International Nickel Co., Inc., The, 67 Wall St., New York 5, N. Y.
International Powder Metallurgy Co., 439 W. Main St., Ridgway, Pa.
International Rectifier Corp., 6809 S. Victoria Ave., Los Angeles 43, Calif.
International Resistance Co., 401 N. Broad St., Philadelphia 8, Pa.
International Television Corp., 236 William St., New York 7, N. Y.
Intervox Corp., 2701 California Ave., Seattle 6, Wash.
Intra-Video Corp. of America 236 William St., New York 7, N. Y.
Ionic Equipment Co., 1705 N. Kenmore Ave., Los Angeles, 27, Calif.
Irvington Varnish & Insulator Co., 10 Argyle Terrace, Irvington 11, N. J.
Isolantite Mfg. Corp., Stirling, N. J.

J-B-L Instrument Co., Sycamore & Mill Rds., Clifton Heights, Pa.
J. B. T. Instruments Inc., 441 Chapel St., New Haven 8, Conn.
J. F. D. Mfg. Co., 6101-23 Sixteenth Ave., Brooklyn, N. Y.
Jackson Electrical Instrument Co., 16 S. Patterson Blvd., Dayton 1, Ohio.
Jackson Industries, Inc., 58 E. Cullerton St., Chicago 16, Ill.
Jamaica Television Mfg. Co., 95-26 Sutphin Blvd., Jamaica 4, N. Y.
James Vibrapower Co., 3224 W. Armitage Ave., Chicago 47, Ill.
Jannette Mfg. Co., 556 W. Monroe St., Chicago 6, Illinois.
Jarrel-Ash Co., 165 Newbury St., Boston 16, Mass.
Jarvis Electronics Corp., 6058 W. Fullerton Ave., Chicago 39, Ill.
Jeffers Electronics, Inc., DuBois, Pa.
Jefferson, Inc., Ray, 40 E. Merrick Rd., Freeport, L. I., N. Y.
Jefferson Electric Co., Bellwood, Ill.
Jeliff Mfg. Corp., C. O., 200 Pequot Ave., Southport, Conn.
Jen Products Co., 419 W. 42nd St., New York 18, N. Y.
Jennings Radio Mfg. Co., 1098 E. William St., San Jose 12, Calif.
Jensen Industries Inc., 329 S. Wood St., Chicago, Ill.
Jensen Mfg. Co., 6601 S. Laramie Ave., Chicago 38, Ill.
Jerrold Electronics Corp., 121 N. Broad St., Philadelphia, Pa.
John-Manville, 22 E. 40th St., New York 16, N. Y.
Johnson Co., E. F., Waseca, Minn.
Johnson Mfg. Co., Inc., Mt. Vernon, Iowa.
Johnson & Hoffman Inc., 65 Ongley St., Rockville Center, L. I., N. Y.
Johnston Foil Mfg. Co., 6100 S. Broadway, St. Louis 11, Mo.
Jones Electronics Co., M. C., Bristol, Conn.
Jones Div., Howard B., Cinch Mfg. Corp., 1026 S. Homan Ave., Chicago 24, Ill.
Jones Optical Works, A. D., Cambridge, Mass.
Jones Spring Co., W. B., 124 E. 7th St., Cincinnati, Ohio.
Judd Co., H. L., 87 Chambers St., New York 7, N. Y.
K. F. Development Co., 820 Woodside Way, San Mateo, Calif.
K-V Transformer Corp., 4414 Park Ave., New York 57, N. Y.
Kaar Engineering Co., 2995 Middlefield Road, Palo Alto, Calif.
Kahle Engineering Co., 1307 7th St., North Bergen, N. J.
Kaiser Aluminum & Chemical Sales, Inc., 1924 Broadway, Oakland 12, Calif.
Kaiser Labs., Inc., 1976 Morena Blvd., San Diego 10, Calif.
Karp Metal Products Co., Inc., 215 63rd St., Brooklyn 20, N. Y.

Kartron, Inc., Box 472, Huntington Beach, Calif.
Kato Engineering Co., 1415 First Ave., Mankato, Minn.
Kay Electric Co., 14 Maple Ave., Pine Brook, N. J.
Kaye-Halbert Corp., 8555 Hayden Ave., Culver City, Calif.
Keasbey & Mattison, Ambler, Pa.
Kettlley Instruments, 1507 Warrensville Center Rd., Cleveland 21, Ohio.
Keller Products, Inc., 41 Union St., Manchester, N. H.
Kelley Klett Mfg. Co., Instrument Div., 12 E. 6th St., Covington, Ky.
Kellogg Switchboard & Supply Co., 6650 S. Cicero Ave., Chicago 38, Ill.
Kelmar Mfg. Corp., 215 Kearney St., San Francisco 8, Calif.
Kennet Division, Union Carbide & Carbon Corp., Madison Ave. and 117th St., Cleveland 1, Ohio.
Kenrick Labs., 1619 W. Grand Ave., Chicago 22, Ill.
Kenyon Mfg. Co., 161 W. 18th St., New York 11, N. Y.
Kenyon Electrical Products, Inc., 23 Brown St., Salem, Mass.
Kennedy & Co., D. S., Cohasset, Mass.
Kent Co., F. E., 44-72 Howard St., Irvington, N. J.
Kenyon Transformer Co., Inc., 840 Barry St., New York 59, N. Y.
Kepco Labs., Inc., 149-14 41st Ave., Flushing, N. Y.
Kester Solder Co., 4212 Wrightwood Ave., Chicago 39, Ill.
Kiethley & Esser Co., Hoboken, N. J.
Keystone Carbon Co., Inc., State Marys, Pa.
Keystone Instrument Corp., Buffalo, N. Y.
Keystone Electronics Co., 50-53 Franklin St., New York 13, N. Y.
Kilburn Glass Co., Inc., J. D., 22 S. Worcester St., Chartley, Mass.
King Laboratories Inc., 337 Solar St., Syracuse 4, N. Y.
Kings Electronics Co., Inc., 811 Lexington Ave., Brooklyn 21, N. Y.
Kingston Radio Co., Inc., Kokomo, Ind.
Kinney Mfg. Co., 3529 Washington St., Boston, Mass.
Kirkham Radio Mfg. Co., 4007 Oak St., Omaha 7, Neb.
Kin Electronics Corp., 155 Waverly Place, New York 14, N. Y.
Kintzberger & Co., Inc., M., 1415 Thirty Seventh St., Brooklyn 18, N. Y.
Kirk & Blum Mfg. Co., 2849 Spring Grove Ave., Cincinnati 25, Ohio.
Kleinert Co., H. B., The, 9 King St., Morristown, N. J.
Klog Motor Spinning Co., 174 Centre Street, New York 13, N. Y.
Klotch & Associates, Hope, Ark.
Knights Co., James, 231 E. Wells St., Sandwich, Ill.
Knox Tool Co., 1435 N. Sheffield Ave., Chicago 22, Ill.
Koh-I-Noor Pencil Co., Bloomsbury, N. J.
Kollsman Instrument Div. of Square D. Co., 80-08 45th Ave., Elmhurst, N. Y.
Kolton Electric Mfg. Co., 123 New Jersey Railroad Ave., Newark 5, N. J.
Koppers Co., Inc., Chemical Div., Koppers Bldg., Pittsburgh 19, Pa.
Korad, Not for Corp., A Standard Avionics Affiliate, 38 Clark St., Newark 8, N. J.
Kraeg Co., Charles W., 52 Dickerson St., Newark, N. J.
Kramer-Trenton Instrument Co., 585 Massachusetts Ave., Cambridge 39, Mass.
Kreis & Jacob Molding & Tool Co., 1200 Gothard St., Riverton, N. J.
Kulka Electric Mfg. Co., Inc., 90 South St., Mt. Vernon, N. Y.
Kuthlan Mfg. Co., 360 State St., Binghamton, N. Y.
Kurman Electric Co., Inc., 35-18 37th St., Long Island City 1, N. Y.
Kurz-Kasch, Inc., 1415 S. Broadway, Dayton 1, Ohio.
Kuthe Laboratories, Inc., 150 Summit St., Newark 4, N. J.
Kwikset Mfg. Co., 3732 San Fernando Rd., Glendale 4, Calif.

L. A. B. Corporation, 43 Delpi Place, Summit, N. J.
L. & R. Mfg. Co., 637 Elm St., Arlington, N. J.
Labarre Corp., 37 E. 6th St., Newark 7, N. J.
Labe Mfg. Co., 2424 Chestnut St., Oakland 7, Calif.
La Magna Mfg. Co., Inc., East Rutherford, N. J.
Lambda Electronics Corp., 103-02 Northern Blvd., Corona, N. Y.
Lamicoid Fabricators, Inc., 4545 Cortland St., Chicago 39, Ill.
Laminated Plastics, Inc., 14818 Euclid Ave., Cleveland 12, Ohio.
La Motte Chemical Products Co., Towson 4, Baltimore, Md.
Lampkin Laboratories, Inc., Bradenton, Fla.
Lancaster & Sessions Co., 1971 W. 85th St., Cleveland, Ohio.
Landis & Gyr, Inc., 104 Fifth Ave., New York 11, N. Y.
Lanscraft Mfg. Corp., 37 W. 65th St., New York 23, N. Y.
Lansdale Tube Co., Church Rd., Lansdale, Pa.
Lansing Sound Inc., James B., 2419 Fletcher Drive, Los Angeles 26, Calif.
Lansing Stamping Co., 1159 S. Pennsylvania Ave., Lansing, Mich.
Lanza Die Cutting Co., 1401a Bronx St., New York 12, N. Y.
Laporte Plasmomat Corp., Unionville, Conn.
Lapp Insulator Co., Inc., Radio Specialties Div., 91 Gilbert St., LeRoy, N. Y.
La Rose & Associates, W. T., 646 Second Ave., Troy, N. Y.
Laughlin Co., Thomas, 149 Fore, Portland, Me.
Laurens Radio Mfg. Co., 3931 Monroe Ave., Wayne, Mich.
Lavoie Laboratories, Morganville, N. J.
Leach Relay Co., 5915 Avalon Blvd., Los Angeles 3, Calif.
Lear, Inc., 110 Ionia Ave., N.W., Grand Rapids 2, Mich.
Lectrolarm Co., 145-03 Jamaica Ave., Jamaica, L. I., N. Y.
Lectro-Max, Inc., 15 S. First St., Geneva, Ill.
Lectronic Research Labs., 1021 Callowhill St., Philadelphia 23, Pa.
Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
Lehigh Structural Steel Co., 17 Battery Pl., New York 4, N. Y.
Lehman Brothers, 114 Christie St., Newark 5, N. J.
Lekos Mfg. Co., Ann Arbor, Mich.
Lektra Laboratories, 30 E. 10th St., New York 3, N. Y.
Lenard, Inc., G. H., 123 Webster St., Dayton 2, Ohio.
Leland Electric Co., 1501 Webster St., Dayton 1, Ohio.
Lenk Mfg. Co., The, 30 Cummington St., Boston 15, Mass.
Lenkurt Electric Co., Inc., San Carlos, Calif.
Lenz Electric Mfg. Co., 1751 North Western Ave., Chicago 47, Ill.
Leonard Electric Products Co., Inc., 1562 61st St., Brooklyn, N. Y.
Leonard High Frequency Labs., Inc., 39 West 60th St., New York 23, N. Y.
Lenz Laboratories, Inc., 360 Bleecker St., New York 14, N. Y.
Leupold & Stevens Instruments, Inc., 4445 N.E. Glisan St., Portland 13, Ore.
Lewis Engineering Co., 62 Rubben Ave., Naugatuck, Conn.
Lewis & Kaufman, Inc., P. O. Box 667, 90 El Rancho Ave., Los Gatos, Calif.
Lewis Spring & Mfg. Corp., 2636 W. North Ave., Chicago 47, Ill.
Liebel Flarsheim Co., 303 W. Third St., Cincinnati 2, Ohio.
Light Electric Corp., 214 Lackawanna Ave., Newark 4, N. J.
Lightstone Co., Inc., 226 Lansing St., Utica, N. Y.
Lilde Air Products Co., Unit of Union Carbide and Carbon Corp., 30 E. 42nd St., New York 17, N. Y.
Lings & Son, Inc., John E., 29th St. and Buren, Camden, N. J.
Line Chemical Co., 29 E. Madison St., Chicago 2, Ill.
Link Radio Corp., 125 W. 17th St., New York, N. Y.
Linton & Bros., Inc., Horace, 3061 Ruth St., Philadelphia 34, Pa.
Linton Falls Instrument Co., 392 Slater St., Stamford, Conn.
Lionville Inc., 4757 Ravenwood Ave., Chicago 40, Ill.
Little Falls Alloys, Inc., 240 Caldwell Ave., Paterson 1, N. J.
Litton Industries, San Carlos, Calif.
Livingston Electronic Corp., Livingston, N. J.
Locke Incorporated, P. O. Box 57, Baltimore 3, Md.
Loge Sound Engineers, Jr. M., 2171 W. Washington Blvd., Los Angeles 7, Calif.
Logack Precision Corp., 98 Worth St., New York 13, N. Y.
Logan Products Corp., 1122 F. St., Lorain, Ohio.
Loral Electronics Corp., 794 E. 140th St., New York 54, N. Y.
Lord Mfg. Co., 1635 W. 12th St., Erie, Pa.
Louis Bros., 3543 E. 16th St., Los Angeles 23, Calif.
Lovibon Mfg. Co., East Liverpool, Ohio.
Lukens Steel Co. & Divisions, By-Products Steel Co. & Lukenweld, 447 Lukens Bldg., Coatesville, Pa.
Luma Electric Equipment Co., P. O. Box 152, Toledo 1, Ohio.
Lumenite Electric Co., 407 E. Dearborn St., Chicago 5, Ill.
Lundey Associates, Mfg. Div., 644 Main St., Acushnet, Mass.
Lurene Rubber Co., Muirhead Ave., Trenton, N. J.
Lyman Electronic Corp., 12 Cass St., Saxonville, Mass.
Lynch Co., F. W., 191 2nd St., San Francisco, Calif.
Lyncon Engineers, Inc., 1721 Delancey St., Philadelphia 3, Pa.

MacKay Laboratories, 1946 N. Kedzie, Chicago, Ill.
McColpin-Christie Corp., 4952 S. Figueroa St., Los Angeles 37, Calif.
McElroy Mfg. Corp., Littleton, Mass.
McIntosh Engineering Laboratory, Inc., 910 King St., Silver Spring, Md.
McLaughlin, J. L. A., Box 529, Lasalle, Calif.
McMurdo Silver Co., Inc., 1240 Main St., Hartford 3, Conn.
McQuay-Norris Mfg. Co., 2320 Marconi Ave., St. Louis 20, Mo.
MB Mfg. Co., 1060 State St., New Haven 11, Conn.
M. P. Convert Installations, Fairfield 10, Conn.
Maas & Waldstein Co., 438 Riverside Ave., Newark 4, N. J.
Macallen Co., The, 16 Macallen St., Boston 27, Mass.
Macdonald & Co., Inc., W. S., 33 University Rd., Cambridge 38, Mass.
Machine-O-Matic, Inc., P. O. Box 238, Ashley, Ohio.
Machlett Laboratories, Springdale, Conn.
Mack Electrical Devices Inc., 43 Glenside Ave., Wyncote, Pa.
Mack Molding Co., Wayne, N. J.
MacLeod & Hanopol, 10 Joiner St., Charlestown 29, Mass.
Magna Electronics Co., 3767-11 W. Jefferson, Los Angeles 16, Calif.
Magnavox Co., The, Components Div., Fort Wayne 4, Ind.
Magnecord, Inc., 360 N. Michigan Ave., Chicago 1, Ill.
Magnetic Analysis Corp., 42-44 Twelfth St., Long Island City 1, N. Y.
Magnetic Core Corp., 142-144 S. Highland Ave., Hasbrouck, N. Y.
Magnetic Devices Corp., 103 S. Van Brunt St., Englewood, N. J.
Magnetic Devices, Inc., 712 East St., Frederick, Md.
Magnetic Instrument Co., 82 W. Main St., West Orange, N. J.
Magnetic Metals Co., Hayes Ave. and 21st St., Camden, N. J.
Magnetic Recorders Co., 7120 Melrose St., Los Angeles, Calif.
Magnetic Windings Div., Essex Wire Corp., Freemansburg Ave. and Hobson Blvd., Easton, Pa.
Magnetics, Inc., P. O. Box 761, Butler, Pa.
Maico Co. Inc., 21 North 3rd St., Minneapolis, Minn.
Maida Development Co., 12 E. Howard St., Phoebus, Va.
Makepeace Co., D. E., Attleboro, Mass.
Malco Tool & Mfg. Co., 4025 W. Lake St., Chicago 24, Ill.
Mallinckrodt Chemical Works, Second and Mallinckrodt Sts., St. Louis 7, Mo.
Mallory & Co., Inc., P. R., 3029 E. Washington St., Indianapolis 6, Ind.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Manufacturers Battery Co., Sub. of Ray-O-Vac Co., Madison, Wis.
Manufacturers Engr. & Equip. Corp., Willow Grove, Pa.
Manufacturers Thread Grinding Inc., P. O. Box 66, Eatontown, N. J.
Marathon Battery Co., Wausau, Wis.
Marion Corp., Gary, Ind.
Marco Industries, 210 South Clementine, Anaheim, Calif.
Marco Industries, Inc., 788 Terrace Blvd., Depew, N. Y.
Marconi Instruments, Ltd., 23 Beaver St., New York 4, N. Y.
Marion Electrical Instrument Co., Manchester, N. H.
Markem Machine Co., Keene, N. H.
Markel Forge Co., Everett 49, Mass.
Marsh Fiberglass Co., 703 Willow St., Chicago 14, Ill.
Marsh Stencil Machine Co., 46 Marsh Bldg., Belleville, Ill.
Martindale Electric Co., Box 617, Edgewater Branch, Cleveland 7, Ohio.
Maryland Electronics Mfg. Corp., 5009 Calvert Rd., College Park, Md.
Masonite Corp., 111 W. Washington St., Chicago 2, Ill.
Massa Laboratories, 1968 Carnegie St., Cleveland, Ohio.
Mattison Television & Radio Corp., 893 Broadway, New York 3, N. Y.
Maxson Corp., W. L., 460 W. 34th St., New York, N. Y.
Maurer Inc., J. A., 37-01 31st St., Long Island City, N. Y.
Mayfair Molded Products Corp., 4449 N. Elston Ave., Chicago 30, Ill.
Measurements Corp., Boonton, N. J.
Meck Industries, John, Liberty at Pennsylvania, Plymouth, Ind.
Meissner Mfg. Div., Maguire Industries, Inc., Mt. Carmel, Ill.
Melco Products, Inc., 22 E. Hennepen Ave., Minneapolis 1, Minn.
Mellaphone Corp., Rochester 2, N. Y.
Melpar, Inc., 452 Swann Ave., Alexandria, Va.
Mepco, Inc., 30-37 Abbett Ave., Morristown, N. J.
Merck & Co., Inc., Rahway, N. J.
Mercoid Corp., The, 4201 Belmont Ave., Chicago 41, Ill.
Merit Coil & Transformer Corp., 4427 N. Clark St., Chicago 40, Ill.
Metal Hyraden Inc., Beverly, Mass.
Metal Textile Corp., 447 E. First Ave., Roselle, N. J.
Meters, Inc., 915 Westfield Blvd., Indianapolis 20, Ind.
Metrade Mfg. Corp., 1733 N. Milwaukee Ave., Chicago 47, Ill.
Metron Instrument Co., 432 Lincoln St., Denver 9, Colorado.
Metropolitan Electronics & Instruments Co., 106 Fifth Ave., New York 11, N. Y.
Mica Fabricating Co., 53 Central Ave., Rochelle Park, N. J.
Mica Insulator Co., Schenectady 1, N. Y.
Micacraft Products Inc., 701 McCarter Highway, Newark 2, N. J.
Micamold Radio Corp., 1087 Flushing Ave., Brooklyn 6, N. Y.
Micarta Fabricators, Inc., 5324 Ravenswood Avenue, Chicago 40, Illinois.
Mice Instrument Co., 80 Trowbridge St., Cambridge 38, Mass.
Micro-Circuits Co., New Buffalo, Mich.
Micro Metallic Corp., 193 Bradford St., Brooklyn, N. Y.
Micro Switch Division of First Industrial Corp., 7 Spring St., Freeport, Ill.
Microwave Equipment Co., Inc., North Caldwell, N. J.
Midco Mfg. & Distributing Co., S. 13th & Kentucky Avenue, Sheboygan, Wisconsin.
Miles Reproducer Co., Inc., 812 Broadway, New York 3, N. Y.
Milford Rivet & Machine Co., Milford, Conn.
Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.
Miller, August E., 9226 Hudson Blvd., North Bergen, N. J.
Miller Co., B. F., P. O. Box 568, Trenton 4, N. J.
Miller Co., J. W., 5917 S. Main St., Los Angeles, Calif.
Miller Corp., William, 362 W. Colorado St., Pasadena, Calif.
Miller Mfg. Co., M. A., 1169 E. 43rd St., Chicago 15, Ill.
Millivac Instruments, Box 3027, New Haven, Conn.
Milwaukee Metal Spinning Co., 4128 W. State St., Milwaukee 8, Wis.
Milwaukee Resistor Co., 700 W. Virginia Street, Milwaukee 4, Wisconsin.
Mineralac Electric Co., 25 N. Peoria St., Chicago, Illinois.
Mines Equipment Division, Joy Mfg. Co., 4215 Clayton Ave., St. Louis, Mo.
Miniature Precision Bearings, Inc., Keene, New Hampshire.

Minneapolis-Honeywell Regulator Co., 2753 Fourth Avenue S., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Roberts Aves., Philadelphia 44, Pa.
Minnesota Electronics Corp., 97 E. Fifth St., St. Paul 1, Minn.
Minnesota Mining & Mfg. Co., 900 Fauquier Ave., St. Paul, Minn.
Minute Man Products, Inc., 309 East 22nd Street, New York 10, N. Y.
Mirror Record Corp., 1133 Broadway, New York 10, N. Y.
Miskella Infra-Red Co., The, E. 73rd & Grand Ave., Cleveland 4, Ohio.
Mission Electric Mfg. Co., 132 W. Colorado Blvd., Pasadena, Calif.
Mitchell Industries, Inc., Camp Wolters, Mineral Wells, Texas.
Mitchell Rand Insulation Co., Inc., 51 Murray Street, New York 7, N. Y.
Model Engineering & Mfg., Inc., Huntington, Indiana.
Model Rectifier Corp., 1510 Nostrand Ave., Brooklyn, N. Y.
Modern Hearing Aids Laboratory, The, 6805 Fraser St., Vancouver, B. C., Canada.
Molded Insulation Co., Aircraft Control Div., 335 E. Price St., Philadelphia, Pa.
Molding Corp. of America, Pawtucket, R. I.
Monitor Products Co., 815 Fremont Ave., So. Pasadena, Calif.
Monroe Coil Co., 2839 N. Narragansett Ave., Chicago 34, Ill.
Monsanto Chemical Co., Plastics Div., Springfield 2, Mass.
Mouradian High Frequency Labs., 13 E. Fort Lee Rd., Bogota, N. J.
Moore Co., Howard J., 108 Park Row, New York 7, N. Y.
Moore Inc., George W., 100 Beaver St., Waltham, Mass.
Morill & Morill, 30 Church St., New York 7, N. Y.
Morris Co., J. E., 394 Elm St., Southbridge, Mass.
Morse Co., Frank W., 1300 Soldiers Field Rd., Boston 35, Mass.
Mosher Electronic Controls, 130 W. 42nd St., New York, N. Y.
Mosinee Paper Mills Co., Mosinee, Wisconsin.
Motoresearch Co., 1600 Junction Ave., Racine, Wis.
Motorola, Inc., 4545 W. Augusta Blvd., Chicago 51, Ill.
Mouse Specialties Co., 1005-1007 W. Washington St., Bloomington, Ill.
Moyen, C. P., 908 Chicago Ave., Chicago, Ill.
Mu-Switch Division, Acro Switch Co., 38 Pequot St., Canton, Mass.
Mueller Electric Co., 1583 E. 31st St., Cleveland 14, Ohio.
Muirhead & Co., Ltd., Beckenham-Kent-England.
Multicore Sales Corp., 164 Duane St., New York 13, N. Y.
Multicore Solders Ltd., Mellier House, Albemarle St., London, W. 1, England.
Multi Metal Wire Cloth Co., Inc., 1350 Garrison Ave., New York 59, N. Y.
Multi Products Tool Co., 123 Sussex Ave., Newark 4, N. J.
Multiple Television Mfg. Co., 987 Hegeman Ave., Brooklyn 8, N. Y.
Muntzing Mfg. Co., Wm. J., Chelsea, Mass.
Murex, Ltd., Rainham-Essex-England.
Murray Industries, Inc., 502 W. Colorado Ave., Colorado Springs, Colorado.
Muter Co., 1255 S. Michigan Ave., Chicago, Ill.
Mycalex Corp. of America, 60 Clifton Blvd., Clifton, N. J.
Mycalex Tube Socket Corp., 60 Clifton Blvd., Clifton, N. J.
Myers & Sons, F. A., Fairview Bldg., Beverly Rd., Pittsburgh 16, Pa.
Myerly, Inc., Arlington Heights Airport, Arlington Heights, Ill.
National Acme Co., 170 E. 131st St., Cleveland 8, Ohio.
National Carbon Division, United Carbide & Carbon Corp., 30 E. 42nd Street, New York 17, N. Y.
National Ceramic Co., 400 Southard St., Trenton 2, N. J.
National Company, Inc., 61 Sherman Street, Malden 48, Mass.
National Electric Coil Co., Columbus 16, Ohio.
National Electrical Machine Shops, Inc., 919 Jesup-Blair Drive, Silver Spring, Md.
National Electric Controller Co., 5307 Ravenswood Avenue, Chicago, Illinois.
National Electronic Mfg. Corp., 35-05 36th St., Long Island City 6, N. Y.
National Electronics, Inc., Geneva, Ill.
National Electronics Labs., Inc., 1713 Kalorama Rd., N. W., Washington 9, D. C.
National Gasket & Washer Mfg. Co., Inc., 124 E. 25th St., New York 10, N. Y.
National Instrument Co., 246 Walnut Street, Newtonville 60, Mass.
National Intercommunicating Systems, 1531 Devon Avenue, Chicago 26, Illinois.
National Lead Co., 111 Broadway, New York 6, N. Y.
National Lock Washer Co., 40 Hermon St., Newark 5, N. J.
National Moldite Co., 1410 Chestnut Ave., Hillside 5, N. J.
National Polytronics Inc., 2430 Atlantic Ave., Brooklyn, N. Y.
National Research Corp., 70 Memorial Drive, Cambridge 42, Mass.
National Screw & Mfg. Co., The, Cleveland 4, Ohio.
National Spectrograph Laboratories, Inc., 4100 Euclid Ave., Cleveland 3, Ohio.
National Technical Laboratories, 820 Mission St., South Pasadena, Calif.
National Union Radio Corp., 350 Scotland Rd., Orange, N. J.
National Varnished Products Corp., The, 211 Randolph Ave., Woodbridge, N. J.
National Video Corp., 3019 W. 47th St., Chicago, Ill.
National Vulcanized Fibre Co., Wilmington, Del.
Nebel Lab., R. E., 1104 Lincoln Place, Brooklyn 13, N. Y.
Nelson Vacuum Pump Co., George F., 2133 Fourth Street, Berkeley 10, Calif.
Neptune-Power Plus Products Co., Detroit, Mich.
Network Mfg. Corp., Bayonne, N. J.
New England Electrical Works Inc., Lisbon, N. H.
New Hampshire Ball Bearings, S Main St., Peterborough, N. H.
New Hermes, Inc., 13-19 University Place, New York 3, N. Y.
New Jersey Wood Finishing Co., Amboy Ave., Woodbridge, N. J.
New Jersey Zinc Co., 160 Front St., New York 7, N. Y.
New Wrinkle, Inc., 1819 Bankers Bldg., 105 W. Adams Ave., Chicago 3, Ill.
New York Solder Co., 684 E. 133rd St., New York 54, N. Y.
New York Transformer Co., Inc., Third Ave., Alpha, N. J.
Newark Spinning & Stamping Co., 471 Bloy St., Hillside 5, N. J.
Newcomb Audio Products Co., 6824 Lexington Ave., Hollywood 38, Calif.
Ney Co., J. M., 179 Elm St., Hartford, Conn.
Niagara Electron Laboratories, Andover, New York.
Nichols Products Co., Moorestown, N. J.
Nickel Cadmium Battery Corp., Easthampton, Mass.
Nielsen Television Corp., Newton Rd., Norwalk, Conn.
Nilsson Electrical Laboratory, Inc., 103 Lafayette St., New York 13, N. Y.
Noblitt Sparks Industries, Columbus, Indiana.
Nonotuck Mfg. Co., Holyoke, Mass.
Norman Laboratories, Ernst, Williams Bay, Wis.
North American Electric Lamp Co., 1014 Tyler St., St. Louis 6, Mo.
North American Philips Co., Inc., 100 East 42nd St., New York 17, N. Y.
North Electric Mfg. Co., 501 S. Market St., Galion, Ohio.
Northeastern Engineering, Inc., Manchester, N. H.
Northern Communications Mfg. Corp., 210 E. 40th St., New York 16, N. Y.
Northern Industrial Chemical Co., 7-11 Elkins St., South Boston 27, Mass.
Northern Radio Co., 314 Bell St., Seattle 1, Wash.
Northern Radio Co., Inc., 143-145 W. 22nd St., New York 11, N. Y.
Norton Co., 1 New Bond Street, Worcester 6, Mass.
Norton Electrical Instrument Co., 59 Hilliard St., Manchester, Conn.
Notheider Winding Labs., 9 Albemarle Ave., Trenton 3, N. J.
Nuclear Development Lab., P. O. Box 7034 Kansas City, Mo.
Nuclear Instrument & Chemical Corp., 223 W. Erie St., Chicago 10, Ill.
Nucleonic Corp. of America, The, 497 Union St., Brooklyn 31, N. Y.
Nukem Products Corp., 111 Colgate Ave., Buffalo 20, N. Y.
Numbersil Stamp & Tool Co., Huguenot Park, Staten Island 12, N. Y.
Nurnberg Thermometer Co., Inc., 4 Carey St., Boston 32, Mass.

Oak Mfg. Co., 1260 N. Clybourn Ave., Chicago 10, Ill.
Oak Ridge Products Mfg. Div. of Video Television, Inc., 284 E. 127th St., New York 35, N. Y.
O'Connor & Co., John T., West Orange, N. J.
Offner Electronics Inc., 5320 N. Keeler Ave., Chicago 25, Ill.
Ohio Carbon Co., 12508 Berea Rd., Cleveland 11, Ohio.
Ohio Crankshaft Co., Tocco Div., 3000 Harvard Ave., Cleveland 5, Ohio.
Okonite Mfg. Co., 4835 W. Flournoy St., Chicago 44, Ill.
Okonite Co., The, Canal Street, Passaic, N. J.
Olex & Son, Inc., A., 4757-59 Melrose Street, Philadelphia 37, Pa.
Olsen Co., Otto K., 1534 Cahuenga, Hollywood 28, Calif.
Olin Industries Inc., Electrical Division, New Haven 4, Conn.
Olympic Metal Products Co., Inc., Phillipsburg, N. J.
Olympic Radio & Television Inc., 34-01 38th Ave., Long Island City, N. Y.
Omaha Scientific Supply Co., 3601 N. 24th St., Omaha 10, Neb.
Onan & Sons Inc., D. W., 3264 Royalston Ave., Minneapolis 5, Minn.
O'Neil-Irwin Mfg. Co., 316 8th Ave. Lake City, Minn.
Opad Sheet Co., 71 Warren St., New York 7, N. Y.
Operadio Mfg. Co., 145th & Indiana Sts., St. Charles, Ill.
Oppenheimer Inc., Alan D., 562-586 Exchange St., Buffalo, N. Y.
Optical Film Engineering Co., 2125 Cherry St., Philadelphia 3, Pa.
Oregon Electronic Mfg. Co., 206 S. W. Washington St., Portland 4, Ore.
Orradio Industries, Opelika, Ala.
Orthon Corp., The, Electronic Div., 196 Alburn Ave., Paterson 7, N. J.
Osborn Products, 475 Main St., Glen Ellyn, Ill.
Osborne Transformer Corp., 948 E. Lafayette Avenue, Detroit 7, Mich.
Owen Laboratories, 9130 Orion St., San Fernando, Calif.
Owens-Corning Fiberglas Corp., Textile Products Div., 16 E. 56th St., New York 22, N. Y.
Owens Illinois Glass Co., Toledo, Ohio.
Oxford Electric Corp., 3911 S. Michigan Avenue, Chicago 15, Ill.
Ozalid Div. of Gen. Aniline & Film Corp., 770 Ansco Rd., Johnson City, N. Y.
Pacific Electricord Company, P. O. Box 1260, Beverly Hills, Calif.
Paisley Products Inc., 1770 Canalport Ave., Chicago 16, Ill.
Palmer Co., Inc., 77 Cordier St., Irvington 11, N. J.
Pan-American Electronics, Inc., 5816 S. Santa Fe Ave., Los Angeles 11, Calif.
Panelyte Div., St. Regis Paper Co., 230 Park Ave., New York, N. Y.
Pancro Mirrors Inc., 2958 Los Feliz Blvd., Los Angeles, Calif.
Panoramic Radio Products, Inc., 10 South Second Ave., Mt. Vernon, N. Y.
Paper Machinery & Research, Inc., 1014 Oak St., Roselle, N. J.
Par-Metal Products Corp., 32-62 49th Street, Long Island City 3, N. Y.
Paragon Electric Co., Two Rivers, Wisconsin.
Paragon-Revolute Corp., 71 South Ave., Rochester 4, N. Y.
Paramount Paper Tube Co., 614 Lafayette St., Fort Wayne, Ind.
Paravox, 2056 E. 4th St., Cleveland 15, Ohio.
Parisian Novelty Co., 3510 South Western Ave., Chicago 9, Ill.
Park Metalware Co., 28 Bank St., Orchard Park, N. Y.
Parker-Kalon Corp., 200 Varick St., New York 14, N. Y.
Parker Rust Proof Co., 2177 E. Milwaukee Ave., Detroit, Mich.
Parkwood Corp., Wakefield, Mass.
Pass & Seymour, Inc., Solvay Station, Syracuse, N. Y.
Patent Button Co. of Tennessee, 2005 Century St., Knoxville, Tenn.
Patton-MacGuyer Co., 17 Virginia Avenue, Providence 5, R. I.
Paul & Beekman, Inc., 1801 Cortland St., Philadelphia 40, Pa.
Pease Co., C. F., 2601 W. Irving Park Rd., Chicago, Ill.
Peck & Harvey, 5736-38 N. Western Ave., Chicago 45, Ill.
Peck Spring Co., 9 King St., Plainville, Conn.
Peerless Electrical Products Co., 6920 McKinley Ave., Los Angeles 1, Calif.
Peerless Photo Products, Shoreham, L. I., N. Y.
Peirce Wire Recorder Corp., 1328 Sherman Avenue, Evanston, Illinois.
Penn Engineering & Mfg. Corp., Box 311, Doylestown, Pa.
Penn Fibre & Specialty Co., 2020 E. Westmoreland St., Philadelphia 34, Pa.
Pentron Corp., The, 611 W. Division St., Chicago 10, Ill.
Penn-Union Electric Corp., 315 State St., Erie, Pa.
Perkin-Elmer Corp., The, Glenbrook, Conn.
Permo, Inc., 6415 Ravenswood Ave., Chicago 26, Ill.
Permoflux Corp., 4900 W. Grand Ave., Chicago 39, Ill.
Pfanstiehl Chemical Co., Metallurgical Div., 104 Lake View Ave., Waukegan, Ill.
Phalo Plastics Corp., 25 Foster St., Worcester 8, Mass.
Phelps Dodge Copper Products Corp., 40 Wall St., New York, N. Y.
Phenix Mfg. Co., 5700 Roosevelt Rd., Chicago 50, Ill.
Philadelphia Insulated Wire Co., 220 N. 3rd St., Philadelphia, Pa.
Philadelphia Steel & Wire Corp., Penn. St. & Belfield Ave., Philadelphia, Pa.
Philadelphia Thermometer Co., 4401 N. Sixth St., Philadelphia, Pa.
Philamon Laboratories, 5717 Third Ave., Brooklyn 20, N. Y.
Philbrick Researches, Inc., George A., 230 Congress St., Boston 10, Mass.
Phillips Corp., Tioga & C Streets, Philadelphia 34, Pa.
Phillips Control Corp., 84 W. Jefferson St., Joliet, Illinois.
Phillips Petroleum Co., Special Products Div., Bartlesville, Okla.
Philmore Mfg. Co., 113 University Place, New York 3, N. Y.
Philson Mfg. Co., Inc., 60-66 Sackett St., Brooklyn 31, N. Y.
Phonograph Needle Mfg. Co., Inc., 42 Dudley St., Providence 5, R. I.
Phosphor Bronze Corp., 20 Franklin St., Seymour, Conn.
Photobell Company, 116 Nassau St., New York 7, N. Y.
Photocon Research Products, 1062 N. Allen Ave., Pasadena 7, Calif.
Photographic Products, Inc., 955 N. Mansfield Ave., Hollywood 38, Calif.
Photoswitch, Inc., 77 Broadway, Cambridge 42, Mass.
Photovolt Corp., 95 Madison Ave., New York 16, N. Y.
Photron Instrument Co., 6516 Detroit Ave., Cleveland 2, Ohio.
Picker X-Ray Corp., 300 Fourth Ave., New York 10, N. Y.
Pickering and Co., 309 Woods Ave., Oceanside, New York.
Pierce Template Corp., 2646 N. Coral Street, Philadelphia 25, Pa.
Piezo Mfg. Corp., 110 E. 42nd Street, New York 17, N. Y.
Piezo Products Co., Whitney St., Framingham, Mass.
Pilgrim Mfg. Co., 155 Chestnut St., Providence, R. I.
Pilot Radio Corp., 37-06 36th St., Long Island City, N. Y.
Pioneer Electric Co., 3700 East Olympic Blvd., Los Angeles 23, Calif.
Pioneer Gen-E-Motor Corp., 5841 W. Dickens Ave., Chicago 39, Ill.
Pioneer Scientific Corp., 295 Lafayette St., New York 12, N. Y.

Piqua Machine & Mfg. Co., Young & College Sts., Piqua, Ohio.
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Planet Mfg. Corp., 225 Belleville Ave., Bloomfield, N. J.
Plaskon Division, Libbey-Owens-Ford Glass Co., 2112-24 Sylvan Avenue, Toledo 6, Ohio.
Plastic Accessories, Inc., 93 Mercer St., New York 12, N. Y.
Plastic Fabricators Co., 440 Sansome Street, San Francisco 11, Calif.
Plastic Metals Division, The National Radiator Co., 169 Bridge Street, Johnstown, Pa.
Plastic Wire & Cable Corp., Jewett City, Conn.
Plastircraft Products Co., 20 Hudson St., New York 13, N. Y.
Plastics & Electronics Co., 272 Northland Ave., Buffalo 8, N. Y.
Plastmold Corp., Attleboro, Mass.
Plastoid Corp., 10 Mill Rd., Hamburg, N. J.
Plax Corp., P. O. Box 1019, Hartford 1, Conn.
Plume & Atwood Mfg. Co., Waterbury, Conn.
Polmettia Co., Inc., 95 Cedar Ave., Pitman, N. J.
Pole Electronics, 119 Bleeker St., New York 12, N. Y.
Polan Industries, 220 Eighth St., Huntington, West Virginia.
Polarad Electronics Corp., 100 Metropolitan Ave., Brooklyn 11, N. Y.
Polymer Corp., The, Reading, Pa.
Polytech Devices, Inc., 118014 E. Grand St., Elizabeth, N. J.
Polytechnic Research & Development Co., Inc., 99 Tillary St., Brooklyn 1, N. Y.
Polytron Corp., 144 Martine Ave., White Plains, N. Y.
Ponts Mfg. Co., 1265 E. Belmont Ave., Fresno 3, Calif.
Post Co., Frederick, 3650 N. Avondale Ave., P. O. Box 4615, Chicago 90, Ill.
Positive Lock Washer Co., 181 Miller St., Newark 5, N. J.
Potomac Machinery Co., 1278 38th St., Brooklyn 18, N. Y.
Potter & Brumfield, Princeton, Indiana.
Potter Co., 1950 Sheridan Rd., No. Chicago, Ill.
Potter Instrument Co., 115 Cutter Mill Rd., Great Neck, N. Y.
Powdered Metal Products Corp., Franklin Park, Ill.
Power Equipment Co., 55 Antoinette St., Detroit 2, Mich.
Powhatan Mining Co., Baltimore 7, Md.
Pratt & Whitney Div., Niles-Bement-Pond Co., West Hartford 1, Conn.
Precise Measurements Co., 942 Kings Highway, Brooklyn 23, N. Y.
Precision Apparatus Co., Inc., 92-27 Horace Harding Blvd., Elmhurst, N. Y.
Precision Electronic Components Reg'd., P. O. Box 264, Granby, Quebec, Canada.
Precision Electronics, 641 Milwaukee Ave., Chicago 22, Ill.
Precision Metal Products Co. of Malden, 542 Eastern Ave., Malden 48, Mass.
Precision Paper Tube Co., 2033 W. Charleston St., Chicago 47, Ill.
Precision Piezo Service, 427 Mayflower St., Baton Rouge 8, La.
Precision Plastic Products Inc., 628-30 W. Lake St., Chicago 6, Ill.
Precision Products Co., 26 Bedford St., Waltham 54, Mass.
Precision Resistor Co., 334 Badger Avenue, Newark 8, N. J.
Precision Tube Co., Inc., 3016 Terrace St., Philadelphia 28, Pa.
Press Engraving Machine Co., 649 Highway No. 29, Hillside, N. J.
Preston Products Div., Chisholm-Ryder Co., Inc., Niagara Falls 2, N. Y.
Princeton Crystal Labs., Inc., 79-89 Seventh Ave., New York 11, N. Y.
Printed Metal Etching Co., 31-03 34th Ave., Long Island City, N. Y.
Printed Wireless Mfg. Co., Inc., Farmingdale Rd., Pickville, L. I., N. Y.
Printex Corp., Burlington, Iowa.
Printo Recording Corp., Paramus, N. J.
Prodelin Corp., 3139 Bellevue Rd., Toledo 6, Ohio.
Prod Electric Corp., Frederick, Md.
Profelco Inc., 95 Mercer St., New York, N. Y.
Progress & Instruments, 68 Greenpoint Ave., Brooklyn 22, N. Y.
Proctor Switches Corp., 143 N. 13th Ave., Mt. Vernon, N. Y.
Product Development Co., Inc., Allentown, N. J.
Production Engineering Co., 119 Hayward Ave., Dayton, Ohio.
Production Equipment Co., 31 & Main St., Cuyahoga Falls, Ohio.
Progressive Mfg. Co., 68 Norwood St., Torrington, Conn.
Progressive Welder Co., 3000 E. Outer Dr., Detroit 34, Mich.
Pure Carbon Co., St. Marys, Pa.
Pyramid Electric Co., 150 Dallas St., Paterson, N. J.
Pyramid Instrument Corp., 44 Howard St., New York 13, N. Y.
Pyramin Products Co., 2228 E. State St., Chicago, Ill.
Pyroferric Co., 401 E. 134th St., New York 54, N. Y.

QRK Electronic Products, 444 N. Circle Drive, Fresno 4, Calif.
Q-V-S, Inc., 15 S. Essex St., Orange, N. J.
Quadrigo Mfg. Co., 711 W. Diversey Ave., Chicago 14, Ill.
Quaker City Gear Works, 1401-15 N. Front St., Philadelphia, Pa.
Quality Components, Inc., St. Marys, Pa.
Quan-Tech Labs Co., 536 E. 42nd Pl., Chicago 16, Ill.

R. B. M. Division, Elden Wire Corp., Logansport, Ind.
RMS Electronics, Inc., 422 E. 6th St., New York, N. Y.
Racon Electric Co., 52 E. 19th St., New York 3, N. Y.
Radar Engineers, 110 University St., Seattle 1, Wash.
Rad-El-Co Mfg. Co., 7580 Garfield Blvd., Cleveland 25, Ohio.
Radex Corp., 2076 N. Elston Avenue, Chicago 14, Ill.
Radiart Corp., The, 3571 W. 62nd St., Cleveland, Ohio.
Radiation Counter Laboratories, Inc., 1844 West 21st St., Chicago 8, Ill.
Radio City Products, 152 W. 25th St., New York 1, N. Y.
Radio Condenser Co., Camden, N. J.
Radio Cores, Inc., 9540 Tully Ave., Oak Lawn, Ill.
Radio Corp. of America, RCA Victor Div., General Offices, Camden, N. J.
Radio Corp. of America, RCA Victor Div., Tube Dept., Harrison, N. J.
Radio Craftsmen, Inc., 1341 S. Michigan Ave., Chicago 5, Ill.
Radio Design Co., 1353 Sterling Place, Brooklyn, N. Y.
Radio Engineering Labs., Inc., 36-40 37th St., Long Island City, N. Y.
Radio Frequency Labs., Inc., Boonton 2, N. J.
Radio Mfg. Engineers Inc., 300-302 First Ave., Peoria 6, Ill.
Radio Materials Corp., 1708 Belmont Ave., Chicago 13, Ill.
Radio Merchandise Sales, 660 Westchester Ave., New York 55, N. Y.
Radio Music Corp., Port Chester, N. Y.
Radio Receptor Co., 251 W. 19th St., New York 11, N. Y.
Radio Specialty Mfg. Co., 2023 S. E. Sixth Ave., Portland 14, Ore.
Radio Transceiver Laboratories, 116-23 Jamaica Ave., Richmond Hill 18, N. Y.
Radioactive Products Inc., 3201 E. Woodbridge St., Detroit 7, Mich.
Radiomarine Corp. of America, 75 Varick St., New York 13, N. Y.
Radionic Transformer Co., 411 S. Sangamon St., Chicago 7, Ill.
Radion Instruments, Inc., 12 West Broadway, New York 7, N. Y.
Railway Communications, Inc., P. O. Box 1783, Lincoln, Nebr.
Ransertone, Inc., 73 Wilsthrop St., Newark 4, N. J.
Rapid Specialties Co., 325 W. Huron Street, Chicago 10, Ill.
Rastan Mfg. Co., The, P. O. Box 1745, New Haven 7, Conn.
Rauland Corp., 4545 N. Knox Ave., Chicago 41, Ill.
Rauland-Borg Corp., 3523 W. Addison St., Chicago 18, Ill.
Rawson Electrical Instrument Co., 111 Potter St., Cambridge 42, Mass.
Raymond Mfg. Co., Div. of Associated Spring Corp., 226 S. Center St., Corry, Pa.
Ray-O-Vac Co., Madison, Wisconsin.
Raytheon Mfg. Co., Equipment Sales Div., Waltham 54, Mass.
Raytheon Mfg. Co., Power Tube Division, Waltham 54, Mass.
Raytheon Mfg. Co., Receiving & Special Tube Div., 55 Chapel St., Newton 58, Mass.
Rea Magnet Wire Co., E. Pontiac St., Fort Wayne, Ind.
Ready Power Co., The, Power Plant Div., 11131 Freud Ave., Detroit 14, Mich.
Rebuilt-It Corp., 395 Broadway, New York, N. Y.
Reckon Corp., 251 Fourth Ave., New York 10, N. Y.
Rectifier Engineering Co., 1803 E. Seventh St., Los Angeles 21, Calif.
Red Arrow Electric Corp., 100 Colt St., Irvington 11, N. J.
Red Bank Division, Bendix Aviation Corp., Red Bank, N. J.
Redmond Co., Inc., Owosso, Mich.
Reeder & Co., Charles M., 373 Victor Ave., Detroit 3, Mich.
Reeves Hoffman Corp., 921 Cherry St., Carlisle, Pa.
Reeves Instrument Corp., 35-54 36th St., Long Island City, N. Y.
Reeves Soundcraft Corp., 10 E. 52nd St., New York 22, N. Y.
REF Mfg. Corp., Jericho Turnpike, Mineola, N. Y.
Reichhold Chemicals Inc., 601-707 Woodward Heights Blvd., Ferndale Sta., Detroit 20, Mich.
Reilly Tar and Chemical Corp., 1615 Merchants Bank Bldg., 11 S. Meridian St., Indianapolis, Ind.
Reiner Electronics Co., 153 W. 25th St., New York, N. Y.
Reiner Mfg. Co., Hagerstown, Md.
Rek-O-Kut Co., Inc., 38-01 Queens Blvd., Long Island City, N. Y.
Reliable Spring and Wire Forms Co., Fulton Rd. and Paris Ave., Cleveland 9, Ohio.
Reliance Automatic Lighting Co., 1919 Mead St., Racine, Wis.
Reliance Instrument Co., 3027 W. Van Buren St., Chicago 12, Ill.
Remington Radio Corp., 80 Main St., White Plains, N. Y.
Remington Rand, Inc., Vernon Dept., 315 4th Ave., New York, N. Y.
Remler Co., Ltd., 2101 Bryant St., San Francisco 10, Calif.
Resarch Co., Paul R., 841 E. 42nd St., Los Angeles 1, Calif.
Republic Steel Corp., Republic Bldg., Cleveland 1, Ohio.
Resistance Products Co., 914 Race St., Harrisburg, Pa.
Resistors, Inc., 5226 W. 26th St., Chicago 50, Ill.
Revere Copper & Brass Inc., 230 Park Ave., New York 17, N. Y.
Rex Rheostat Co., 9 Ecaturst Rd., Baldwin, N. Y.
Reynolds Metals Co., Market Research Dept., 19 E. 47th St., New York 17, N. Y.
Rhodes Inc., M. H., 30 Bartholomew Ave., Hartford, Conn.
Richards Co., Inc., Arelay S., 78 Winchester St., Newton Highlands 61, Mass.
Richardson Allen Corp., 15 W. 20th St., New York 11, N. Y.
Richardson Company, The, 2767 Lake St., Melrose Park, Ill.
Riggs & Jeffreys, Inc., 140 Glenridge Ave., Montclair, N. J.
Ripley Co., Inc., P. O. Box 31, Middletown, Conn.
Riverside Metal Co., Riverside, N. J.
Robbins & Myers, Inc., 1345 Lagonda Ave., Springfield 99, Ohio.
Robinette, Co., W. C., 802 Fair Oaks Ave., South Pasadena, Calif.
Robinson Aviation, Inc., Teterboro, N. J.
Robotron Corp., 5570 W. Chicago Blvd., Detroit 4, Mich.
Rockbestos Products Corp., 308 Nicoll St., New Haven 4, Conn.
Roebling's Sons Co., John A., 640 Broad St., Trenton 2, N. J.
Rogan Bros., 2500 W. Irving Park, Chicago 18, Ill.
Rogers Corp., Manchester, Conn.
Rohm & Haas Co., Washington Square, Philadelphia 5, Pa.
Rola Co., Inc., The, 2530 Superior Ave., Cleveland 14, Ohio.
Rollan Electrical Co., 8020 S. South Park, Chicago, Ill.
Roller-Smith, Bethlehem, Pa.
Rollin Co., 2070 N. Fair Oaks Ave., Pasadena 3, Calif.
Rome Cable Corp., 330 Ridge St., Rome, N. Y.
Rosen Engineering Products, Inc., Raymond 32nd & Walnut Sts., Philadelphia 4, Pa.
Ross Mfg. Co., 860 Washington St., Burlington, Iowa.
Rostan Corp., 202 East 44th St., New York 17, N. Y.
Rotron Mfg. Co., Inc., 7-9 Schoonmaker Lane, Woodstock, N. Y.
Rowe Industries, 1702 Wayne St., Toledo 9, Ohio.
Royal Diamond Tool Co., 172 Green St., Boston 30, Mass.
Roylyn Inc., 716 W. Wilson Ave., Glendale 3, Calif.
Rubanoid Co., 1751 Ridge Ave., Philadelphia, Pa.
Ruby Chemical Co., 68 McDowell St., Columbus, Ohio.
Ruge-de Forest, Inc., 76 Massachusetts Ave., Cambridge 39, Mass.
Rupp's Assembling & Mfg. Works, 2141 N. Seminary Ave., Chicago 14, Ill.
Russell, Burdsall & Ward Bolt and Nut Co., Midland Ave., Port Chester, N. Y.
Russell Electric Co., 4501 South Western Blvd., Chicago 9, Ill.
Russell & Stoll Co., Inc., 125 Barclay St., New York 7, N. Y.
Ryerson & Son, Inc., J. T., Box 8000-A, Chicago, Ill.

"S" Corrugated Quenched Gap Co., Scientific Electric Div., 107 Monroe St., Garfield, N. J.
S. M. A. Co., 4721 N. Kedzie, Chicago, Ill.
S. N. C. Mfg. Co., Inc., Box 277, Oshkosh, Wis.
St. John X-RAY Laboratory, Califon, N. J.
St. Mary's Carbon Co., State Rd., St. Marys, Pa.
Sanborn Co., 39 Osborn St., Cambridge 39, Mass.
Sangamo Electric Co., Springfield, Illinois.
Sargent Rayment Co., The, 212 Ninth St., Oakland, Calif.
Sarkes Tarzian Inc., 415 N. College Ave., Bloomington, Ind.
Sauereisen Cements Co., Sauereisen Bldg., Pittsburgh 15, Pa.
Saxl Instrument Co., Harvard, Mass.
Schawitz Engineering, Crescent Blvd. at Drexel Ave., Camden Township, Camden 13, N. J.
Schauer Mfg. Corp., 2117 Reading Rd., Cincinnati 2, Ohio.
Scherectady Varnish Co., Schenectady, N. Y.
Schiro Fan, Inc., George, 200 Lafayette St., New York 12, N. Y.
Schoff Co., Walter L., 9106 Santa Monica Blvd., Beverly Hills, Calif.
Schottland Vibration & Shock Div., New York Testing Labs., Inc., 80 Washington St., New York 6, N. Y.
Schrader Co., J., 4601 Fenwick Ave., Cleveland, Ohio.
Schuylkill Electronics, Inc., Sellersville, Pa.
Schutter, Carl W., Rockville Centre, N. Y.
Schuttig & Co., Inc., 4th & Kearney Sts., N. E., Washington 17, D. C.
Schwartzer Inc., Peter J., 405 Lexington Ave., New York 17, N. Y.
Sciaky Bros., Inc., 4916 W. 47th St., Chicago 38, Ill.
Scientific Radio Products Co., 738 W. Broadway, Council Bluffs, Iowa.
Scientific Radio Service, 4301 Sheridan St., University Park, Md.
Scintilla Magneto Div., Bendix Aviation Corp., Sidney, N. Y.
Scott, Inc., Herman Hosmer, 385 Putnam Ave., Cambridge 39, Mass.
Scott Radio Labs., Inc., 4451 N. Ravenswood Ave., Chicago 40, Ill.
Scovill Mfg. Co., Industrial Fastener Div., Waterbury, Conn.
Scully Machine Co., 62 Walter St., Bridgeport, Conn.
Seaboard Electric Co., 145 Hudson St., New York, N. Y.
Seaver Carbon Co., 289 Church St., New York 13, N. Y.
Sealed Cone, 45 Willard Ave., Providence 5, R. I.
Sealol Metals Corp., 228 E. 45th St., New York 17, N. Y.
Seemuth Corp., J. P., 1500 N. Dayton Ave., Chicago 22, Ill.
Selector Industries, Inc., 401 East 144th St., New York 54, N. Y.
Sensitive Research Instrument Corp., 9 Pine Ave., Mt. Vernon, N. Y.
Sentinel Radio Corp., 2100 Dempster St., Evanston, Ill.
Sentry Trustee Co., 106 E. W. Washington St., Portland 4, Oregon.

Serdex, Inc., 91 Cambridge St., Boston, Mass.
Servo Corp. of America, 2020 Jericho Turnpike, New Hyde Park, N. Y.
Servo-Tek Products Co., 4 Godwin Ave., Paterson, N. J.
Servomechanisms Inc., 142 Mineola Blvd., Mineola, N. Y.
Sessions Clock Co., Forestville, Conn.
Shakeproof Inc., Div. of Illinois Tool Wks., 2501 N. Keeler Ave., Chicago 39, Ill.
Shalcross Mfg. Co., 10 Jackson Ave., Collingdale, Pa.
Shannon Luminous Materials Co., 7356 Santa Monica Blvd., Hollywood 46, Calif.
Shaw Insulator Co., 160 Colt St., Irvington 11, N. J.
Sheffield Instrument Corp., 2021 N. Lincoln St., Burbank, Calif.
Sheldon Electric Co., Tu-Bo Colt St., Irvington, N. J.
Sherman Industrial Electronics Co., Inc., 505 Washington Ave., Belleville 9, N. J.
Sherman Lamination Co., The, Stratford, Conn.
Sherman Mfg. Co., H. B., 22 Barney St., Battle Creek, Mich.
Sherold Specialty Products, 68 E. 131st St., New York, N. Y.
Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.
Sherwin-Williams Co., 101 Prospect Ave., N. W., Cleveland 1, Ohio.
Shevers Inc., Harold, 123 W. 64th St., New York 23, N. Y.
Short Wave Plastic Forming Co., 2921 W. Alameda St., Burbank, Calif.
Shure Brothers, Inc., 225 W. Huron St., Chicago 10, Ill.
Shurite Meters, 61 Hamilton St., New Haven 8, Conn.
Sickles Co., F. W., P. O. Box 330, Chicopee, Mass.
Sierra Electronic Corp., San Carlos, Calif.
Sightmaster Corp., 20 E. 35th St., New York 16, N. Y.
Sigma Instruments, Inc., 80 Ceylon St., Boston 22, Mass.
Signal Engineering & Mfg. Co., 154-6 W. 14th St., New York, N. Y.
Signet Development Co., 188 W. Randolph St., Chicago 1, Ill.
Sig-Trans Inc., Amesbury, Mass.
Silicones Miller Co., 10 Parker Ave., West, So. Orange, N. J.
Simmonds Saw & Steel Co., Lockport, N. Y.
Simplex Wire & Cable Co., 79 Sidney St., Cambridge 39, Mass.
Simpson Electric Co., Div. of American Gage & Machine Co., 5218 W. Kinzie St., Chicago 44, Ill.
Simpson Mfg. Co., Inc., Mark, 32-28 49th St., Long Island City 3, N. Y.
Sipp Eastwood Corp., Kent and Sumner Sts., Paterson, N. J.
Sisalkraft Co., 205 W. Wacker Drive, Chicago 6, Ill.
Skaneateles Mfg. Co., Inc., 102 Jordan St., Skaneateles, Syracuse 2, N. Y.
Skinner Electric Valve Div., The Skinner Chuck Co., 40 Belden Ave., Norwalk, Conn.
Skydyne Inc., River Rd., Port Jervis, N. Y.
Slobodian Co., Anthony, Bridgeport, Conn.
Small Motors, Inc., 2076 Elston Ave., Chicago 14, Ill.
Smith, Inc., Herman H., 405 44th St., Brooklyn 20, N. Y.
Smith Mfg. Co., Nathan R., 105 Pasadena Ave., So. Pasadena, Calif.
Smith Paper Inc., Lee, Mass.
Smuckler & Co., Inc., A. F., 232 Tillary St., Brooklyn 1, N. Y.
Sola Electric Co., 4633 W. 16th St., Chicago 50, Ill.
Soldering Specialties Co., Summit, N. J.
Somerset Laboratories, Inc., 1701 Palisades Ave., Union City, N. J.
Sonar Radio Corp., 69 Myrtle Ave., Brooklyn 1, N. Y.
Sonic Recording Products, Inc., 58 Mill Rd., Freeport, N. Y.
Sonotone Corp., P. O. Box 260, Saw Mill River Road, Elmsford, N. Y.
Sorensen & Co., Inc., 375 Fairfield Ave., Stamford, Conn.
Sorgel Electric Co., 838 W. National Ave., Milwaukee 4, Wis.
Sound Apparatus Co., Sterling, N. J.
Soundscriber Corp., 146 Munson St., New Haven 4, Conn.
South River Metal Products Co., South River, N. J.
Southington Hardware Mfg. Co., Southington, Conn.
Southwestern Industrial Electronic Co., 2831 Post Oak Rd., Houston 19, Texas.
Sparton Corp., 2400 E. Hall Rd., Muskegon Heights, Mich.
Sparton Television Co., 5508 New Utrecht Ave., Brooklyn 19, N. Y.
Sparton Radio-Television Div., The Sparks-Withington Co., Jackson, Mich.
Spaulding Fibre Co., Inc., 310 Wheeler St., Tonawanda, N. Y.
Speak-O-Phone Recording & Equipment Co., 23 W. 60th St., New York, N. Y.
Special Chemicals Corp., 30 Irving Place, New York 3, N. Y.
Special Instruments Laboratory, Inc., 1003 Highland Ave., Knoxville, Tenn.
Special Products Co., 9115 Brookville Rd., P. O. Box 471, Silver Spring, Md.
Specialty Slattery Co., Madison 4, Wisconsin.
Speer Carbon Co., Lincoln Ave., St. Marys, Pa.
Speer Resistor Corp., St. Marys, Pa.
Spencer Television Co., Inc., 1029 Webster Ave., New York 11, N. Y.
Spencer Kennedy Labs., Inc., 186 Massachusetts Ave., Cambridge 39, Mass.
Spencer Thermostat Co., 34 Forest St., Attleboro, Mass.
Sperman Metal Specialties, 27 Columbia Place, Brooklyn 2, N. Y.
Sperry Gyroscope Co., Div. of The Sperry Corp., Great Neck, N. Y.
Sperry Products Inc., Danbury, Conn.
Sperti, Inc., Cincinnati 12, Ohio.
Sprague Electric Co., North Adams, Mass.
Sta-Warm Electric Co., Ravenna, Ohio.
Stackpole Carbon Co., St. Marys, Pa.
Staedtler Inc., J. S., 55 Worth St., New York, N. Y.
Stamford Metal Specialty Co., 429 W. Broadway, New York 12, N. Y.
Stancil-Hoffman Corp., 1016 N. Highland Ave., Hollywood 38, Calif.
Standard Arsturus Corp., 54 Clark St., Newark 4, N. J.
Standard Coil Products Co., 2329 N. Pulaski Rd., Chicago 39, Ill.
Standard Crystal Co., 400 Armstrong Ave., Kansas City 7, Kans.
Standard Electric Time Co., The, 89 Logan St., Springfield, Mass.
Standard Electrical Products Co., 402 E. 1st St., Dayton 3, Ohio.
Standard Electronics Research Corp., 2 East End Ave., New York 21, N. Y.
Standard Locknut & Lockwasher Inc., 504 N. Capitol Ave., Indianapolis, Ind.
Standard Piezo Co., 127 Cedar St., Carlisle, Pa.
Standard Pressed Steel Co., Jenkintown 10, Pa.
Standard Telephones & Cables Ltd., Connaught House, Aldwych, London, W. C. 2, England.
Standard Transformer Corp., Elston, Kedzie & Addison Sts., Chicago 18, Ill.
Standard Varnish Works, 2600 Richmond Terrace, Staten Island 3, N. Y.
Standard Winding Corp., 44-62 Johnes St., Newburgh, N. Y.
Stanley Works, The, New Britain, Conn.
Stanwyck Winding Co., 137 Walsh Ave., Newburgh, N. Y.
Star Expansion Products Co., 147-149 Cedar St., New York 6, N. Y.
Star Kimble Electric Co., 200 Bloomfield Ave., Bloomfield, N. J.
Star Measurements Co., 442 East 166th St., New York 56, N. Y.
Star Porcelain Co., 61 Muirhead Ave., Trenton 9, N. J.
Staten Co., 19 New York Ave., Hartford 6, Conn.
Statham Laboratories, Inc., 9328 Santa Monica Blvd., Beverly Hills, Calif.
Staver Co., Inc., 91 Pearl St., Brooklyn 1, N. Y.
Steel Co., Herman D., Lafayette Bldg., Philadelphia 6, Pa.
Steger Furniture Mfg. Co., Steger, Ill.
Steinen Mfg. Co., Wm., 43 Bruen St., Newark 5, N. J.
Steiner-Ives Co., 16 Avenue L, Newark 5, N. J.
Stephens Mfg. Corp., 8538 Warner Drive, Culver City, Calif.
Sterling Engineering Co., Laconia, N. H.
Sterling Mfg. Co., 9205 Detroit Ave., Cleveland 2, Ohio.
Sterling Television Inc., 15 W. Lake St., Chicago 1, Ill.
Stevens-Arnold Inc., 22 Elkins St., South Boston, Mass.
Stevens Mfg. Co., Inc., Mansfield, Ohio.
Stevens Mfg. Co., Inc., Geo., 6022 N. Rogers Ave., Pulaski & Peterson, Chicago 30, Ill.
Stevens Products Inc., 94-98 Mail St., East Orange, N. J.
Stevens Wire Insulating Co., 6022 N. Rogers Ave., Pulaski & Peterson Ave., Chicago 30, Ill.
Stevenson Bros. & Co., 110 Race St., Philadelphia 6, Pa.
Steward Mfg. Co., D. M., Chattanooga, Tenn.
Stewart Mfg. Corp., F. W., 4311 Ravenswood Ave., Chicago 13, Ill.
Stewart-Warner Electric Div., Stewart-Warner Corp., 1826 Diversey Parkway, Chicago 14, Illinois.
Stiefel Co., Inc., Herman H., 27 Park Place, New York 7, N. Y.
Stimpson Co., Inc., Edwin B., 74 Franklin Ave., Brooklyn 5, N. Y.
Stoddart Aircraft Radio Co., 6644 Santa Monica Blvd., Hollywood 38, Calif.
Stokes Machine Co., F. J., 5850 Tabor Road, Olney Post Office, Philadelphia 20, Pa.
Stolle Engineering & Mfg. Co., 3970 S. Grand Ave., Los Angeles 37, Calif.
Stover Lock Nut & Machinery Corp., Hilton & Holly Sts., Easton, Pa.
Stow Manufacturing Co., 445 State St., Binghamton, N. Y.
Streeter-Amet Corp., 4101 N. Ravenswood Ave., Chicago 13, Ill.
Stromberg-Carlson Co., Rochester 3, N. Y.
Stronghold Screw Products Inc., 216-222 West Hubbard St., Chicago 10, Ill.
Struthers-Dunn, Inc., 150 N. 13th Street, Philadelphia 7, Pa.
Stupakoff Ceramic & Mfg. Co., Latrobe, Pa.
Submarine Signal Div., Raytheon Mfg. Co., Waltham, Mass.
Summerill Tubing Co., Div., Columbia Steel & Shafting Co., P. O. Box 1567, Pittsburgh 30, Pa.
Sun Copper & Wire Co., 132 Beckwith Ave., Paterson, N. J.
Sun Dial Corp., E. Passaic Ave., Caldwell Township, N. J.
Super Electric Products Corp., 46 Oliver St., Newark, N. J.
Super Flow Solder Co., Inc., 90 State St., Albany, N. Y.
Superior Electric Co., The, 83 Meadow St., Bristol, Conn.
Superior Flake Graphite Co., 33 S. Clark St., Chicago 3, Ill.
Superior Flux & Mfg. Co., 1302 Ontario St., Cleveland 13, Ohio.
Superior Instruments Co., 327 Fulton St., New York 7, N. Y.
Superior Tube Co., 2504 Germantown Pike, Norristown, Pa.
Supreme, Inc., Greenwood, Miss.
Surprenant Mfg. Co., 199 Washington St., Boston 10, Mass.
Swartz & Co., Chicago, Ill.
Swiss Jewel Co., Lafayette Bldg., Philadelphia 6, Pa.
Switchcraft, Inc., 1328-30 N. Halsted St., Chicago 22, Ill.
Sylvania Electric Products, Inc., General Sales & Executive Offices, 1740 Broadway, New York 19, N. Y.
Sylvania Electric Products, Inc., Radio & Television Div., 254 Rano St., Buffalo 7, N. Y.
Sylvania Electric Products, Inc., Radio Tube Div., Emporium, Pa.
Symphony Radio & Television Corp., 721 N. Martel Ave., Los Angeles 46, Calif.
Symphonic Radio & Electronic Corp., 292-8 Main St., Cambridge 42, Mass.
Synchro Start Products, Inc., 1046 W. Fullerton Ave., Chicago 14, Ill.
Syncar Products Co., Malden, Mass.
Synthane Corp., Oaks, Pa.
Synvar Corp., 415 E. Front St., Wilmington, Del.
Syracuse Ornamental Co., Inc., 581 S. Clinton St., Syracuse, N. Y.

Tablet & Ticket Co., 1021 W. Adams St., Chicago 7, Ill.
Taks Corp., Newark, Ohio.
Talk-A-Phone Co., 1512 S. Pulaski Rd., Chicago 23, Ill.
Taybern Equipment Co., Inc., 120 Greenwich St., New York 6, N. Y.
Taylor Fibre Co., Norristown, Pa.
Taylor Tubes, Inc., 2312 Wabansia Ave., Chicago 47, Ill.
Tech Laboratories, Inc., Bergen & Edsall Blvds., Palisades Park, N. J.
Tech-Master Products Co., 443-445 Broadway, New York 13, N. Y.
Technical Appliance Corp., Sherburne, N. Y.
Technical Associates, 3730 San Fernando Rd., Glendale 4, Calif.
Technical Materiel Corp., The, 453 W. 47th St., New York 19, N. Y.
Technicraft Laboratories, Inc., Thomaston-Waterbury Rd., Thomaston, Conn.
Technicraft Supply Co., Radiocrafters, 1156 Commonwealth Ave., Boston 34, Mass.
Technitrol Engineering Co., 3212 Market St., Philadelphia, Pa.
Technology Instrument Corp., 1058 Main St., Waltham, Mass.
Telner Engineering Corp., 115 Madison St., Malden 48, Mass.
Tektronix, Inc., 712 S. E. Hawthorne Blvd., Portland 14, Ore.
TelAutograph Corp., 16 W. 61st St., New York 23, N. Y.
Tele King Corp., 601 W. 26th St., New York 1, N. Y.
Tele-Tone Radio Corp., 540 W. 58th St., New York 19, N. Y.
Telechron Inc., Homer Ave., Ashland, Mass.
Telectro Components, 141 Belleville Ave., N. J.
Television Co., The, 4019 Prospect St., Cleveland 3, Ohio.
Telegraph Condenser Co., Ltd., Wales Farm Rd., Acton, London, W. 3.
Telemark Electronics Corp., 150 Broadway, New York, N. Y.
Telemark, Inc., 100 Greyrock Pl., Stamford, Conn.
Teleptonics Corp., Park Ave., Huntington, N. Y.
Telequip Radio Co., 1901 S. Wentworth, Chicago, Ill.
Telerad-io Engineering Corp., 99 Wall St., New York 5, N. Y.
Teletronics Laboratory, Inc., 352 Maple Ave., Westbury, L. I., N. Y.
Television Associates, Inc., E. Michigan St., Michigan City, Ind.
Television Utilities Corp., 1261 Broadway, New York 1, N. Y.
Television Zoomar Corp., Room 2223, 500 Fifth Avenue, New York, N. Y.
Tele-Video Corp., 241 Fairfield Ave., Upper Darby, Pa.
Teletronics Corp., 8479 Higuera St., Culver City, Calif.
Television Equipment Corp., 238 William St., New York, N. Y.
Television Projects, Inc., 3660 Coral Way, Miami 34, Fla.
Telex, Inc., Telex Park, St. Paul 1, Minn.
Tel-Instrument Co., Inc., 50 Paterson Ave., E. Rutherford, N. J.
Tel-O-Tube Corp. of America, Paterson, N. J.
Telrex, Inc., Box 879, Rutherford & Neptune Highway, Asbury Park, N. J.
Telvision Laboratories, Inc., 542 N. Parkside Ave., Chicago 44, Ill.
Tempo Record Co. of America, 8540 Sunset Blvd., Hollywood 46, Calif.
Tennessee Eastman Corp., Sub., Eastman Kodak Co., Kingsport, Tenn.
Tenney Engineering Inc., 26 Avenue B., Newark 5, N. J.
Tensolite Corp., 7 Hudson St., N. Tarrytown, N. Y.
Terpening Co., L. H., 16 W. 61st St., New York, N. Y.
Tetrad Corp., 60 N. Broadway, Yonkers 2, N. Y.
Thali Plastic Engineering Co., 155 Chambers St., New York, N. Y.
Ther Electric & Machine Works, 15 South Jefferson St., Chicago, Ill.
Thermador Electric Mfg. Co., 5119 District Blvd., Los Angeles 22, Calif.
Thermal Syndicate Ltd., 12 E. 46th St., New York 17, N. Y.
Thomas & Betts Co., Inc., 36 Butler Street, Elizabeth 1, N. J.
Thomas & Skinner Steel Products Co., 1122 E. 23rd St., Indianapolis, Ind.
Thomas Electronics, Inc., 118 9th St., Passaic, N. J.
Thompson Corp., The, George S., South Pasadena, Calif.
Thompson & Associates, John E., 7210 S. Yates Ave., Chicago 49, Ill.
Thor Ceramics Inc., 225 Belleville Ave., Bloomfield, N. J.
Thordarson Electric Mfg. Div., Maguire Industries, Inc., 500 W. Huron St., Chicago 10, Ill.

Thwing-Albert Instrument Co., 5351 Pulaski Avenue, Philadelphia 44, Pa.
Tibbetts Industries, Inc., Camden, Maine.
Times Facsimile Corp., 229 W. 43rd St., New York, N. Y.
Timken Roller Bearing Co., Canton 6, Ohio.
Tinnerman Products Inc., 2038 Fulton Rd., Cleveland 13, Ohio.
Titan Metal Mfg. Co., Bellefonte, Pa.
Titeflex, Inc., 500 Frelinghuysen Ave., Newark 5, N. J.
Todd Tran Copr., 156 Gramatan Ave., Mt. Vernon, N. Y.
Tor-Tee Corp., 247 Pearl St. N. W., Grand Rapids 2, Mich.
TopFlight Tape Co., Hotel Ridg, York, Pa.
Topping Mfg. Co., 642 Benton Ave., San Francisco 10, Calif.
Tork Clock Co., Inc., 1 Grove St., Mt. Vernon, N. Y.
Torsion Co., 53-76 Northland Ave., St. Louis 12, Mo.
Transcoils Inc., 130 High St., Boston 10, Mass.
Transicoil Corp., 107 Grand St., New York, N. Y.
Transformer Engineers, 384 South Arroyo Parkway, Pasadena, Calif.
Transmitter Equipment Co., Inc., 345 Hudson St., New York 14, N. Y.
Transradio, Ltd., 138A Cromwell Rd., London SW 7, England.
Trans-Sonics, Inc., Bedford Airport, Bedford, Mass.
Transvision Inc., 460 North Ave., New Rochelle, N. Y.
Trav-Ler Radio Corp., 571 W. Jackson Blvd., Chicago 10.
Trescal Television Productions, Inc., 2214 E. 75th St., Chicago 49, Ill.
Triad Portable Case Corp., 2345 Boston Rd., Bronx 67, N. Y.
Triad Transformer Mfg. Co., 2258 Sepulveda Blvd., Los Angeles 64, Calif.
Trick Rue Mfg. Co., 2446 N. 54th, Milwaukee 12, Wis.
Triplett Products Co., 1545 N. Ashland Ave., Chicago 22, Ill.
Tronic Inc., 400 W. Lake St., Libertyville, Ill.
Tropic-Air, Inc., 1600 Island Ave., McKees Rocks, Pa.
Triplett & Barton Inc., 811 N. Lake St., Burbank, Calif.
Trident Electrical Instrument Co., 286 Harmon Road, Bluffton, Ohio.
Triumph Mfg. Co., 913 W. Van Buren St., Chicago 7, Ill.
Trumbull Electric Mfg. Co., Plainville, Conn.
Truscon Steel Co., Youngstown, Ohio.
Tubular Rivet & Stud Co., Williston 78, Mass.
Tung-Sol Lamp Works Inc., 95 Eighth Ave., Newark 4, N. J.
Turner Co., The, 909 17th St., N. E., Cedar Rapids, Iowa.
Tuttle & Kift, 1955 N. Monitor St., Chicago 39, Ill.

U.H.F. Research Corp., 224 Seventh St., Racine, Wis.
Ulanet Co., The, Division United Cork Companies, 459 Waterfront St., Newburyport, Mass.
Ulanet Co., George, 419 Market St., Newark 5, N. J.
Ultratronic Electronics, Uberaj, Oregon.
Ultra-Violet Products, Inc., 145 Pasadena Ave., S. Pasadena, Calif.
Ulsan Electric Tools Inc., 619 Ducommun St., Los Angeles 54, Calif.
Uniform Tubes, Stout Lane & Lewiston St., Box Borough, Philadelphia, Pa.
Unimax Switch Div. of W. L. Maxson Corp., 460 W. 34th St., New York 1, N. Y.
Unimbrakes Inc., 1038 Potomac St., N. W., Washington 7, D. C.
United Gas Chemical Co., Conshohocken, Mass.
United Electric Products Co., 24 Filson Place, Newark 7, N. J.
United Gas Faucets Corp., Cambridge 42, Mass.
United Condenser Corp., 437 E. 149th St., New York 54, N. Y.
United Electric Controls Co., 85 School St., Watertown 72, Mass.
United Electronics Co., 42 Spring St., Newark 2, N. J.
United Industries, Inc., Everett, Mass.
United Screw & Bolt Corp., 2311 W. Cortland St., Chicago 47, Ill.
United Shoe Machinery Corp., 140 Federal St., Boston, Mass.
U. S. Electrical Motors, Inc., 200 E. Slauson Ave., Los Angeles, Calif.
U. S. Electronics Co., 262 Culver St., New Haven 11, Conn.
U. S. Electrical Corp., 276 Warren St., Lyndhurst, N. J.
U. S. Engineering Co., 521 Commercial St., Glendale 3, Calif.
U. S. Gauge Div., American Machine and Metals, Inc., Sellersville, Pa.
U. S. Gasoline Co., Saginaw, Mich.
U. S. Instrument Corp., 409 Bridge St., Lyndon, N. J.
U. S. Rubber Co., 1230 Avenue of the Americas, New York 20, N. Y.
U. S. Steel Wire Spring Co., 1800 Finley Ave., Chesterton, Ohio.
U. S. Stoneware Co., The, Akron 9, Ohio.
U. S. Television Mfg. Corp., 3 W. 61st St., New York 23, N. Y.
United Tectrol Labs., Box 625-W, Morristown, N. J.
United Transformer Co., 150 Varick Street, New York 13, N. Y.
United Wood Specialty Mfg. Co., Inc., 952 Broadway, Fall River, Mass.
Universal Broadcast Equipment Corp., 6055 Northwest Highway, Chicago 31, Ill.
Universal Drafting Machine Corp., 1960 Larkin Ave., Cleveland 2, Ohio.
Universal Electric Co., 808 E. Main St., Owosso, Mich.
Universal Winding Co., 1655 Elmwood Ave., Cranston 3, R. I.
University Loudspeakers, Inc., 80 S. Kensico Ave., White Plains, N. Y.
Utah, Inc., E. Franklin St., Huntington, Indiana.

V-M Corp., Benton Harbor, Mich.
Vaco Products Co., 317 E. Ontario St., Chicago 11, Illinois.
Vacuum Electronic Engineering Co., 316 37th St., Brooklyn 2, N. Y.
Vacuum Tube Products, 302 North Clementine St., Oceanside, Calif.
Valco Mfg. Co., 4700 W. Walton St., Chicago 51, Ill.
Vallorbs Jewel Co., Lancaster, Pa.
Valley Crystals, Highland St., Holliston, Mass.
Vaneptronic Corp., The, 237 John St., Bridgeport 3, Conn.
Vapor Recovery Systems Co., 2820 N. Alameda, Compton, Calif.
Varflex Corp., 308 N. Jay St., Rome, N. Y.
Variable Condenser Corp., 65 Hope St., Brooklyn, N. Y.
Varian Associates, 99 Washington St., San Carlos, Calif.
Vara Mfg. Co., Inc., Box 638, Garland, Texas.
Vector Electronic Co., 1101 Riverside Drive, Los Angeles 31, Calif.
Vectron, Inc., 235 High St., Waltham, Mass.
Veeder-Root, Inc., Hartford 2, Conn.
Vendo Co., 7400 E. 12th St., Kansas City 8, Mo.
Vibrapin Corporation, 425 Bush St., San Francisco 8, Calif.
Vibration Systems, Inc., 1040 W. Fort St., Detroit 26, Mich.
Vibroplex Co., Inc., 833 Broadway, New York, N. Y.
Vickers Electric Div., Vickers Inc., 1815 Locust St., St. Louis 3, Mo.
Victor Electric Products Inc., 2950 Robertson Ave., Cincinnati 9, Ohio.
Victoreen Instrument Co., 5806 Hough Ave., Cleveland 3, Ohio.
Video Corp. of America, 229 W. 28th St., New York 1, N. Y.
Viewex Inc., 35-01 Queens Blvd., Long Island City 1, N. Y.
Vinidette Co., 521 Fifth Ave., New York 17, N. Y.
Vitamite Company, The, 227 W. 64th St., New York 23, N. Y.
Vitramon, Inc., Stepney, Conn.
Vitrohm Corp., 918 Oak St., Wyoming, Cincinnati 15, Ohio.
Vokar Corp., 7300 Huron River Drive, Dexter, Mich.
Volkert Metal Stampings, Inc., John 223-34 46th Ave., Queens Village 8, N. Y.
Vulcan Electric Co., 68 Horton St., Danvers, Mass.

Waage Electric Inc., 54 Park Place, New York 7, N. Y.
Wade Electric Products Co., 211 Jacob St., Sturgis, Mich.
Wagner Electric Corp., 6400 Plymouth Avenue, St. Louis, Missouri.
Waldes Kohinoor Inc., 47-16 Austel Place, Long Island City 1, N. Y.
Walker Co., George, 118 Amsterdam Ave., Passaic, N. J.
Walker Turner Div., Kearney & Trecker Corp., 639 South Ave., Plainfield, N. J.
Wilkerson Co., 5908 Marilyn Ave., Culver City, Calif.
Wallace & Tiernan Products, Inc., Belleville 9, N. J.
Walsh Automatic Timer Corp., Graybar Bldg., New York, N. Y.
Walter Co., Inc., E., 1400 Atlantic Ave., Brooklyn 16, N. Y.
Waltham Screw Co., 77 Rumford Ave., Waltham, Mass.
Wandler, Inc., 23 W. 24th St., New York 10, N. Y.
Ward Leonard Electric Co., 31 South St., Mt. Vernon, N. Y.
Ward Products Corp., Div. of the Gabriel Co., 1523 E. 45th St., Cleveland 3, Ohio.
Warren Mfg. Co., Inc., 250 Fair St., New Haven, Conn.
Warrick Co., Chas. F., 16251 Hamilton Ave., Detroit 3, Mich.
Warrick, Frederick P., 1940 Grenfell Rd., Bloomingdale, Mich.
Waterbury Companies, Inc., Waterbury 90, Conn.
Waterman Products Co., Inc., 2445 A-B Emerald St., Philadelphia 25, Pa.
Watres Co., F., 1229 Buttonwood St., Philadelphia 24, Pa.
Webster Chicago Corp., 5622 Bloomingdale Ave., Chicago 39, Ill.
Webster Electric Co., 1900 Clark St., Racine, Wis.
Webster Spring Corp., 136-162 Johnson St., Brooklyn 1, N. Y.
Weil & Co., J. W., 1315 Cherry Street, Philadelphia 7, Pa.
Weinschel Engineering Co., 125 William St., New York 7, N. Y.
Welch Scientific Co., W. M., 1515 Sedgwick St., Chicago 10, Ill.
Welker Mfg. Co., 804 Pusker St., Exeter, Pa.
Wells Gardner & Co., 2701 N. Kildare Ave., Chicago 39, Ill.
Wellmore Co., 19500 West 8 Mile Rd., Detroit 19, Mich.
Wenaco Electronic Components, Inc., 244 E. 46th St., New York 17, N. Y.
West Coast Electronics Co., 1401 S. Burlington Ave., Los Angeles 6, Calif.
West Virginia Pulp & Paper Co., Pulp Products Dept., 230 Park Ave., New York 17, N. Y.
Westberg Mfg. Co., 612 N. Michigan Ave., Chicago 11, Ill.
Western Electro-Acoustic Labs., 621 S. Spring St., Los Angeles 14, Calif.
Western Felt Works, 4029 Ogden Ave., Chicago, Ill.
Western Insulated Wire Co., 2421 E. 30th St., Los Angeles, Calif.
Western Lithograph Co., E-Z Code Division, 600 East Second St., Los Angeles 54, Calif.
Western Sound & Electric Labs., Inc., 805 S. Fifth St., Milwaukee 4, Wis.
Western Union Telegraph Co., 60 Hudson St., New York 13, N. Y.
Westfield Metal Products Co., Inc., Elm & Burton Sts., Westfield, Mass.
Westinghouse Electric Corp., P. O. 868, Pittsburgh 30, Pa.
Westinghouse Electric Corp., Electronic Tube Sales Dept., Bloomfield, N. J.
Westline Electronics Co., 11660 Olympic Blvd., Los Angeles 25, Calif.
Weston Electrical Instruments Corp., 614 Frelinghuysen Ave., Newark 5, N. J.
Weymouth Instrument Co., 1440 Commercial St., East Weymouth 89, Mass.
Wheaton Co., T. C., Industrial Div., 220 G St., Millville, N. J.
Wheelco Instruments Company, 847 W. Harrison Street, Chicago 7, Ill.
Wheeler Insulated Wire Co., Inc., 150 E. Aurora St., Waterbury 91, Conn.
Whistler & Sons, Inc., S. B., 752 Military Rd., Buffalo 17, N. Y.
Whitaker Cable Corp., Kansas City 16, Mo.
White Central Mfg. Co., S. S., Industrial Div., 10 E. 40th St., New York, N. Y.
Whitehead Stamping Co., 1691 W. Lafayette Blvd., Detroit 16, Mich.
Whiteman, P. A., 630 N. Wisner Ave., Park Ridge, Ill.
Whitney Blake Co., New Haven, Conn.
Wickwire Spencer Steel Div., The Colorado Fuel and Iron Corp., 500 5th Ave., New York 18, N. Y.
Wiedemann Machine Co., 4272 Wissahickon Ave., Philadelphia 42, Pa.
Wilbur & Williams Co., 41 Leon St., Boston 15, Mass.
Wilcox Electric Co., 1400 Chestnut St., Kansas City, Mo.
Wilcox-Gay Corp., Charlotte, Mich.
Wildberg Bros. Smelting & Refining Co., 741 Market St., San Francisco 2, Calif.
Wile Electric Co., New London, Conn.
Wilkor Products Inc., 2482 Detroit Ave., Cleveland 13, Ohio.
Willard Storage Battery Co., 246 E. 131st St., Cleveland 1, Ohio.
Williams & Co., C. K., 2001 Lynch Ave., East St. Louis, Ill.
Williams Shop Radio Co., 4366 Mentone St., San Diego 7, Calif.
Willyard, Hampton, Mass.
Wilmington Fibre Specialty Co., P. O. Drawer 1028, Wilmington 99, Del.
Wilmotte Inc., Raymond M., 1469 Church St., N. W., Washington 5, D. C.
Wilson & Co., S. D., 2 N. Passaic Ave., Chatham, N. J.
Wilson Co., H. A., The, 105 Chestnut St., Newark 5, N. J.
Winthrop Corp., S. 7th & Division Sts., Sioux City, Iowa.
Winchester Electronics, Inc., Glenbrook, Conn.
Winchester Repeating Arms Co., Div. of Olin Industries, Inc., New Haven, Conn.
Wind Turbine Co., Tower & Antenna Div., F. Market St. & Rewak, R. R., West Chester, Pa.
Wireware Corp. of America, 2331 Halsey St., Brooklyn 27, N. Y.
Witt Co., 5221 Greene St., Philadelphia 44, Pa.
Wisconsin Porcelain Co., Sun Prairie, Wis.
Wood Counter Laboratory, N., 5646 Harper Ave., Chicago 37, Ill.
Wood Electric Co., Inc., C. D., 70-17 83rd St., Glendale 27, N. Y.
Woodworking Inc., 8000 W. Olive Ave., Burbank, Calif.
Worcester Precast Aluminum Corp., 13-15 Hope Ave., Worcester 5, Mass.
Worthington Associates Inc., The, 66 Needham St., Newton Highlands 61, Mass.
Wurlitzer Electronic Devices, Rarkin, Ill.
Wright & Sons Co., William E., West Warren, Mass.
Wrought Washer Mfg. Co., 2264 S. Bay St., Milwaukee 7, Wis.
Wurlitzer Co., Rudolph, The, North Tonawanda, N. Y.

York Materials Co., Inc., P. O. Box 510, Jamaica, N. Y.
Young Brothers Co., 1829 Columbus Rd., Cleveland, Ohio.

Z & W Machine Products Inc., Electronic Div., 5151 St. Clair Ave., Cleveland 3, Ohio.
Zenith Electric Co., 152 W. Walton St., Chicago 10, Ill.
Zenith Optical Sr., Div. of Pulse Industries, Huntington 14, West Virginia.
Zenith Radio Corp., 6001 Dickens Ave., Chicago 39, Ill.
Zephyr Products Co., 160 E. 116th St., New York 29, N. Y.
Zerkalow Co., D., 15 Park Row, New York 7, N. Y.
Zetka Television Tubes Inc., 131-37 Getty Ave., Clifton, N. J.
Zierick Mfg. Corp., Beechwood & Rockdale Aves., New Rochelle, N. Y.
Zipher Mills Inc., 112-130 26th St., Brooklyn 32, N. Y.

Distributors of
ELECTRONIC COMPONENTS AND EQUIPMENT

The following is a list of distributors who are selling and stocking, for immediate delivery, electronic components, instruments, audio equipment, associated apparatus and allied products. These distributors perform a valuable service to manufacturers of electronic equipment by providing quick delivery to meet the urgent requirements of designers and purchasing agents. This list is provided for the convenience of our subscribers and comprises the leading electronic distributors in the United States. Distributors who are advertisers in this issue have their names boldfaced and page number reference made to their advertisements. For further information regarding the services of these distributors, kindly refer to their advertisements.

ALABAMA

Ack Radio Supply Co., 2205 3rd Ave., N., Birmingham 3.
Allen & Jemison Co., Tuscaloosa.
Auto Service Co., 1916 S. 4th Avenue, Birmingham.
Bessemer Radio Supply Co., 116-118 N. 20th, Bessemer.
Clary, Co., James W., 2024 Fourth Ave., Birmingham.
Forbes Distributing Co., 2600 Third Avenue, S., Birmingham 5.
Hand Wholesale Radio, 231 South St., Dothan.
Harris Supply Co., Inc., 10 N. Water St., Mobile 6.
McDavid, & Co., Inc., R. P., 1630 Second Ave., Birmingham.
McGowin-Lyons Hardware & Supply Co., 113-125 N. Water St., P. O. Box 1209, Mobile.
Nelson Radio & Supply Co., 265 St. Louis St., Mobile 10.
Nolin-McInnis, Inc., 205 Commerce St., Montgomery 3.
Reid Distributing Co., 1724 Fifth Ave., N., Birmingham.
Signal Radio Supply Co., 243 E. Troy St., Dothan.
Southeastern Radio Parts Co., 210 Court St., Montgomery.
Teague Hardware Co., 204 Commerce St., Montgomery.

ALASKA

Alaska Radio Supply, Inc., Box 61-318, 5th Ave., Anchorage.

ARIZONA

Dahl Brothers, 526 W. Jefferson St., Phoenix.
Electrical Equipment Co. of Arizona, P. O. Box 2630, Phoenix.
Midland Specialty Co., 233 S. 11th Avenue, Phoenix.
Radio Parts of Arizona, 36 W. Madison St., Phoenix.
Radio Specialties & Appl. Corp., 401 W. Jackson, P. O. Box 2229, Phoenix.
Standard Radio Parts, 551 N. 4th Ave., Tucson.

ARKANSAS

Blytheville Radio Supply, 112 S. First St., Blytheville.
Carlton Wholesale Radio Inc., 104 W. 4th St., Little Rock.
Martin Wholesale Radio Supply, 1207 W. Kingshighway, Paragould.
Southern Radio Supply, 1519 Main St., Little Rock.
White Radio Supply Co., David, P. O. Box 408, 1222 Main St., Little Rock.
Wise Radio Supply, 1001 Towson Ave., Fort Smith.

CALIFORNIA

Altshuler Co., Cass, 6038 Telegraph Ave., Oakland.
Arbuckle, Jack C., 525 E. 19th Street, Bakersfield.
Arbuckle, Jack C., 2440 Kent St., Fresno.
Associated Radio Distributors, 1251-9 Folsom St., San Francisco.
Barnett, Kaemper, Dealers Supply Co., 1950 Mission St., San Francisco.
Braun-Knecht-Heimann Co., 1400 16th St., San Francisco.
Brill & Co., W. D., 198 10th St., Oakland.
Brill Co., W. D., 96 Camino Encinos, Orinda.
Brown Co., C. C., 61 Ninth St., San Francisco 3.
California Electronic Supply, 11801 W. Pico Blvd., Los Angeles 34.
Capitol Records, Inc., Sunset & Vine, Hollywood 28.
Channel Radio Supply Co., 434 State St., Santa Barbara.
Coast Electric Co., 744 G St., San Diego 12.
Dean Co., Fred S., 969 American Ave., Long Beach 13.
Delaronett Radio Supply, 1260 Van Ness St., Fresno.
Dow Radio Supply Co., 1759 E. Colorado St., Pasadena 4.
Dunlap Wholesale Radio Co., 2001 "O" St., Sacramento.
Dunlap Wholesale Radio Co., Carter W., 12 N. Aurora St., Stockton 8.
Electric Supply Co., 149 12th St., Oakland.
Electronic Equipment Distributors, 1228 Second Ave., San Diego.
Electronic Supply Co., 150 W. Green St., Pasadena.
Empire Electronic Supply, Inc., 37 E. Union St., Pasadena.
Figart's Radio Supply Co., 6320 Commodore Sloat Dr., Los Angeles 36.
Gough Industries, Inc., 827 E. First St., Los Angeles.
Haggerty Radio Supply, 6826 San Fernando Rd., Glendale.
Henry Radio Shop, 11240 W. Olympic Blvd., Los Angeles.
Hollywood Radio Supply Inc., 5606 Hollywood Blvd., Hollywood 28.
Inland Electronic Supply, 863 Colton Ave., San Bernardino.
Kaemper-Barrett Dealers Supply Co., 1940 Ashby Ave., Berkeley.
Kaemper-Barrett Dealers Supply Co., 1850 Mission St., San Francisco.
Kemp Co., E. M., 1115 R Street, Sacramento.
Kieruff & Co., 725 L St., Fresno.
Kieruff & Co., 820-830 W. Olympic Blvd., Los Angeles.
Lynde Radio Supply, Larry, 853 Pine Ave., Long Beach.
Mac's Radio Supply, 8320 Long Beach Blvd., South Gate.
Martin Distributing Co., 2303 S. Union Ave., Los Angeles 7.
Meyberg Co., Inc., Leo J., 2027 S. Figueroa St., Los Angeles 15.
Meyberg Co., Leo, 70 Tenth St., San Francisco.
Millers Radio & Television, 168 12th St., Oakland.
Nelson Brothers Co., 630 N. Alvarado, Los Angeles.
Pacific Radio Exchange, 1407 Cahuenga Blvd., Los Angeles.
Pacific Wholesale Co., 116 N. 9th St., San Francisco.
Papet Bros., 2639 E. Fourth St., Los Angeles.
Pasadena Radio Supply, 6110 Santa Monica Blvd., Hollywood 38.
Quement Inc., Frank, 161 W. San Fernando St., San Jose.
Radio Doc, 721 S. Main St., Los Angeles.
Radio Equipment Distributors, 312 W. Pico Blvd., Los Angeles 15.
Radio Parts Co., Inc., 1045 11th Ave., San Diego.
Radio Parts Sales, 5222 S. Vermont Ave., Los Angeles.
Radio Products Sales, Inc., 1501 S. Hill St., Los Angeles 15.
Radio Specialties Co., 1956 S. Figueroa St., Los Angeles 7.
Radio & Television Equipment, 709 Cherry Ave., Long Beach.
Radio & Television Equipment, 207 Oak St., Santa Ana.
Radio Television Supply Co., 341 W. 18th St., Los Angeles 18.
Ravenscroft, Inc., A. E., 2320 S. Hill St., Los Angeles.
Sacramento Electric Supply Co., 1219 S St., Sacramento.
San Francisco Radio & Supply Co., 1282-84 Market St., San Francisco.
Scott Radio Supply, 266 Alamitos Ave., Long Beach 2.
Shanks & Wright, 2045 Kettner Blvd., San Diego 1.
Shelley Radio Co., 2008 Westwood Blvd., Los Angeles 25.
Smith & Crawford, 156 Ninth St., San Francisco 3.
Thompson & Holmes, Ltd., 650 Second St., San Francisco.
United Radio & Electronics Co., 1356 S. Flower St., Los Angeles.
Universal Radio Supply Co., 1729 So. Los Angeles St., Los Angeles.
Valley Electronic Supply Co., 1302 N. Magnolia Blvd., Burbank.
Valley Radio Supply, 716 Baker St., Station A, Bakersfield.
Weatherford Co., R. V., 6919 San Fernando Rd., Glendale 1.
Wenger Co., E. C., 1450 Harrison St., Oakland.
Western Electronic Supply Corp., 7007 Melrose Ave., Los Angeles 38.
Western Radio & Television Supply Co., 1415 Imta St., San Diego 1.
Western Theatrical Equipment Co., 337 Golden Gate Ave., San Francisco 2.
Wholesale Radio & Electric Supply Co., 140 Ninth St., San Francisco.
Yale Radio Electric, 6616 Sunset Blvd., Los Angeles.
Zach Radio Supply Co., 1426 Market St., San Francisco.

COLORADO

Henrie & Bolthoff Co., 1635-17th St., P. O. Box 5310 Terminal Sta., Denver 17.
Interstate Radio & Supply Co., 1639 Tremont Place, Denver.
Niles Phonograph & Radio, 505-07 14th St., Denver.
Radio & Electronic Supply Co., 540 Ute Ave., Grand Junction.
Radio Products Supply Co., 1237 16th St., Denver 12.
Walker Radio Co., L. B., 218 W. Eighth St., Pueblo.

CONNECTICUT

Blind Radio Supply, The, 439 W. Main St., Waterbury 23.
Brown Co., Thomas H., 15-25 Whiting St., New Haven 10.
Congress Radio Co., 207 Congress Avenue, New Haven.
Hatry & Young, Inc., 1700 Main St., Bridgeport.
Hatry & Young, Inc., 203 Ann St., Hartford 3.
Hatry & Young Inc., 77 Broadway, New Haven.
Hatry & Young, Inc., 525 Main St., Stamford.
Hatry & Young, Inc., 89 Cherry St., Waterbury.
Hatry & Young of New London, Inc., 429 Bank St., New London.
Moses Radio Electronics Co., 54 Flower St., Hartford 5.
Snell & Co., R. G., 317 Asylum St., Hartford 3.
Stamford Radio Supplies, 562 Atlantic Ave., Stamford.
United Radio Supply, 47-53 E. Main St., New Britain.
Universal Radio Co., Inc., 61 E. Main St., New Britain.

DELAWARE

Radio Electric Service Co. of Pa., Inc., 4th & Tatnall Sts., Wilmington.
Wilmington Electrical Spec. Co., 405 Delaware Ave., Wilmington.

DISTRICT OF COLUMBIA

American Amplifier & Telev. Corp., 1111 19th St., N. W., Washington.
Capitol Radio Wholesalers, 2120 14th St., N. W., Washington 9.
Electronic Wholesalers, Inc., 2010 14th St., N. W., Washington 9.
Kenyon Radio Supply Co., 2214 14th St., N. W., Washington 9.
Rucker Radio Wholesalers, 1312 14th St., N. W., Washington.
Silberne Radio & Elec. Co., 3308-10 Eleventh St., N. W., Washington 10.
Southern Wholesalers, Inc., 707 Edgewood St., N. E., Washington 17.

FLORIDA

Cooper Radio Co., 648 Second Ave., S., St. Petersburg.
East Coast Radio & Television Co., 914 N. Miami Avenue, Miami.
Electric Supply Co., Inc., 106 S. Franklin St., Tampa 1.
Electronic Supply Co., 61 N. E. 9th St., Miami.
Flagler Radio Co., 1068 W. Flagler St., Miami.
Goddard Distributors, Inc., 1309 N. Dixie, W. Palm Beach.
Grice Radio & Electronic Supplies, 358 E. Wright St., Pensacola.
Gulf Electric & Hardware Co., 115 E. Gregory St., Pensacola.

Hammond Morgan, Inc., 9 S. Terry St., Orlando.
Herman Radio Supply Co., 1745 N. E. Second Ave., Miami 36.
Kinkade Radio Supply Co., 1402-04 Laura Street, Jacksonville.
Kinkade Radio Supply Co., 402 W. Fortune St., Tampa.
Morley Radio Co., 944 Main St., Sarasota.
Radio Accessories Co., 1054 S. Florida Ave., Lakeland.
Radio Accessories Co., 62 E. Pine St., Orlando.
Radio Parts Co., 712 Main St., Jacksonville.
Sea Coast Appliance Distrs., Inc., 36 NE 21st St., Miami.
Southeast Audio Co., 112 W. Union St., Jacksonville.
Southern Hardware & Bicycle Co., 2336 Liberty St., Jacksonville.
Thurow Distributors, Inc., 15-17 E. Church St., Jacksonville.
Thurow Distributors, Inc., 420 S. W. 8th Avenue, Miami.
Thurow Distributors, Inc., 131 S. Court St., Orlando.
Thurow Distributors, Inc., 213 E. Tennessee St., Tallahassee.
Thurow Distributors, Inc., 134-136 S. Tampa St., Tampa.
Thurow Distributors, Inc., Box 3007, West Palm Beach.
Waldor Radio & Appliance, 1809 N. E. Second Avenue, Miami 36.
Welch Radio Supply, 408 N. 4th St., S., St. Petersburg.

GEORGIA

Atlanta Photograph Co., 27 Pryor St., S.W., Atlanta.
Concord Radio Corp., 265 Peachtree St., Atlanta 3.
Economic Auto Stores, Inc., 2150 Ramblerd Highway, PO Box 50078, Atlanta.
Electronic Distributing Co., 754 Ponce de Leon Place, N. E., Atlanta 5.
Garvin Electric Co., 69 Fourth St., N. W., Atlanta 3.
Sue White Radio Co., 654 Mulberry St., Macon.
Hatcher Co., A. S., 590-96 Third St., Macon.
Prestwood Electronics Co., 706 Reynolds St., Augusta.
Radio Sales & Service Co., 1326 First Ave., Columbus.
Southeastern Radio Parts Co., 442 W. Peachtree St., Atlanta.
Southeastern Radio Parts Co., Montgomery St., Savannah.
Specialty Distributing Co., 104 Pine Ave., Albany.
Specialty Distributing Co., 405 Peachtree St., NE, Atlanta.
Specialty Distributing Co., Inc., 534 Arch St., PO Box 815, Macon.
Specialty Dist. Co., 233 E. Broughton St., Savannah.
Yancey Co., Inc., 140 W. Peachtree St., N.W., Atlanta 3.

IDAHO

Cranbrook's Radio Supply, 1502 State St., Boise.
Kinkade Electronics Inc., 114 Pawsley St., Boise.

ILLINOIS

ALLIED RADIO CORP., 833 W. Jackson Blvd., Chicago 7. ADV. PG. 326.
Alverson Sales Co., 208 E. Front St., Bloomington.
Bowman & Co., J. G., 919 E. 79th Street, Chicago 19.
Central Electric Co., 1700 Spring Park Rd., Chicago.
Chauncey's Inc., 4737 W. Chicago Avenue, Chicago 51.
Chicago Apparatus Corp., 1735 N. Ashland Avenue, Chicago.
Concord Radio, 901 Jackson Blvd., W., Chicago.
Cooper Supply Co., 945 Main Street, Quincy.
Fox Electric Supply Co., 67-69 N. State Street, Elgin.
Gates Radio Co., 123 Hampshire, Quincy.
Hesterger Radio Supply, 13th First Avenue, Peoria 6.
Hyland Electrical Supply Co., 700 W. Jackson Blvd., Chicago.
Illinois Appliance Co., 407 W. First Street, Dixon.
Klaus Radio & Electric Co., 701 Main Street, Peoria 2.
Lansley Radio Supply, 802 N. Milwaukee St., Joliet.
Lofgren Distributing Co., 1302 4th Avenue, Moline.
Loughane & Company, 804 N. Water Street, Decatur.
Lubke Sales Corp., 1024 Irving Park Rd., Chicago.
Mertz Electric Co., 210 N. Illinois St., Belleville.
Montgomery Ward & Co., W. Chicago Ave. & Lasalle St., Chicago.
Newark Electric Co., Inc., 323 W. Madison Street, Chicago 6.
Pilgrim Distributing Co., 910 W. Jackson Blvd., Chicago.
Radio Parts Co., 415 W. Randolph St., Chicago 6.
Radio Parts Outlet, Inc., 4301 Lincoln Avenue, Chicago 18.
Rudnick Co., 601 W. Randolph St., Chicago 6.
Spiegel, Inc., 1061 W. 35th St., Chicago 9.
Triangle Industries Corp., 650 W. Adams Street, Chicago.
Tri-City Radio Supply, 1919 Fourth Avenue, Rock Island.
WALKER JIMIESON, INC., 311 S. Western Avenue, Chicago 12. ADV. PG. 274.
Wilson Supply Co., 108 W. Jefferson Street, Springfield.
York Radio Supply Co., 801-805 N. Broadway, Decatur.

INDIANA

Archer & Ensinger, 1348 Wabash Avenue, Terre Haute.
Associated Distributors, Inc., 219-219 E. Maryland Street, Indianapolis 4.
Bowman & Co., J. G., 109 Lafayette Street, Valparaiso.
Commercial Sound & Radio Co., 108 S. Fellow Avenue, South Bend.
Graham Co., Inc., Phillip E., 2616 W. Michigan Street, Indianapolis 22.
Hoh Alliance & Supply Company, 106 N. Main Street, Crown Point.
Lafayette Radio Supply, Inc., 408 E. North Street, Lafayette.
Maurer Radio Supply Company, 524 N. Illinois Street, Indianapolis.
Pembroton Laboratories, 919 Broadway, Fort Wayne 2.
Radio Distributing Co., 1013 N. Capital Avenue, Indianapolis.
Radio Distributing Co., 612 S. Carroll Street, South Bend.
Radio Electronic Supply Co., 1419 Cameron Street, Lafayette.
Seybert's Radio Supply Co., 1331 Main Street, Anderson.
Van Sickle Radio Supply Co., 34 W. Ohio Street, Indianapolis.
Warren Radio Co., 720 S. Clinton, Fort Wayne.

IOWA

Bue Distributing Co., 498 N. Grandview Avenue, Dubuque.
Duke's Radio Company, 209 Sixth Street, Sioux City.
Farnsworth Radio & Television Co., 623 Jefferson, Waterloo.
Gifford-Brown, Inc., 106 1st Street, SW, Cedar Rapids.
Gifford-Brown, Inc., 1216 Grand Avenue, Des Moines 9.
Iowa Radio Corporation, 1212 Grand Avenue, Des Moines 9.
Ken-Els Radio Supply Co., 810 N. 9th, Fort Dodge.
Midwest-Timmerman Co., 114 Western Avenue, Davenport.
Orthark Co., G. W., 10th and Mulberry, Des Moines.
Radio Trade Supply Co., 1224 Grand Avenue, Des Moines 9.
Radio Trade Supply Corp., 115 W. Second, Ottumwa.
Ray Mac Supply Co., 613 Water Street, Waterloo.
RCA Victor Distributing Corp., 1235 W. 5th Street, Davenport.
Sidles Co., 912 Locust Street, Des Moines.
Sioux City Radio & Appliance Co., 210 W. 7th Street, Sioux City 16.
Union Supply Co., 4th & Washington, Burlington.
World Radio Laboratories, Inc., 740-744 W. Broadway, Council Bluffs.

KANSAS

Acme Radio Supply, 516 Quincy Street, Topeka.
Amateur Radio Equipment Co., Inc., 1215 E. Douglas Street, Wichita.
Pistelow Co., Inc., John A., 125 Kansas Avenue, Topeka.
Pratt Distributors, 118 W. 2nd Street, Wichita 2.
Four-State Radio & Supply Co., 227 Santa Fe, Salina.
Interstate Distributors Inc., 1216 E. Douglas, Wichita 7.
Overton Electric Co., Inc. 522 Jackson Street, Topeka.
Pittsburg Radio Supply Co., 212 S. Broadway, Pittsburg.
Radio Supply Co., 1125-27 E. Douglas, Wichita.
RCA Victor Distributing Corp., 851 N. Water, Wichita.
Western Distributors, 227 N. Santa Fe, Salina.

KENTUCKY

Burks & Co., P. J., 911 W. Broadway, Louisville 3.
Central Electronic Supply Co., Inc., 203 W. 4th Street, Owensboro.
Ewald Distributing Co., 509 S. 4th Street, Louisville 3.
Miller, Burney, 249 E. Main Street, Lexington.
Peerless Electronic Equipment Co., 912-914 S. 2nd Street, Louisville 3.
Radio Equipment Co., 480 Skain Avenue, Lexington 34.
Universal Radio Supply Co., 215 S. 7th Street, Louisville 3.
West Kentucky Electronic Supply Co., 1305 Broadway, Paducah.

MAINE

Cressey & Allen, 81 Commercial Street, Portland 4.
Maine Electronic Supply Corp., 13 Deer Street, Portland.
Radio Service Laboratory, 74 Exchange Street, Bangor.
Radio Service Laboratory, 618 Free Street, Portland 3.
Radio Supply Co., Inc., 26 Cross Street, Auburn.

MARYLAND

D & H Distributing Co., 25 S. Liberty Street, Baltimore.
Kann-Ellert Electronics Inc., 9 South Howard Street, Baltimore 3.
Radio Electric Service Co., 3 N. Howard St., Baltimore 1.
Rucker Radio Wholesalers, 8044 14th St., Silver Spring.
Wholesale Radio Parts Co., Inc., 311 W. Baltimore St., Baltimore 1.
Zimmerman Wholesalers, 41 Baltard St., Cumberland.
Zimmerman Wholesalers, 114 E. Washington St., Hagerstown.

LOUISIANA

Alamo Supply Co., Am St., 916-18 N. Claiborne Ave., New Orleans 16.
Automotive Supply Co., 2150 Dewitt St., New Orleans 22.
Bell Radio Supply Co., 816 S. Broad St., New Orleans.
Central Radio Supply, 113 Jackson St., Alexandria 1.
Columbia Radio & Supply Co., 1040 3rd St., New Orleans 13.
Diamond Radio & Supply Co., 1420 Bienville St., New Orleans.
Electronic Supply Co., 203 Magazine St., New Orleans.
Electronic Supply Co., 1751 N. 21st St., Baton Rouge.
Hine & McNeil Co., N. 3rd & Pine Sts., Monroe.
Kusemay Sales Co., 220 Crockett St., Shreveport.
Lyon & Co., Inc., S. H., 447 Bienville St., New Orleans.
Mid-State Supply, 901 Carondelet St., New Orleans.
Radio Electronic Supply, 1419-21 Cameron St., Lafayette.
Radio Parts, Inc., 805 Howard St., New Orleans.
Schaefer & Sons, Inc., F. H., 215 Lake St., Lake Providence.
Shuler Supply Co., 415 Dryades St., New Orleans.
Southern Radio Supply, 407 S. Roman St., New Orleans 19.
Walther Bros. Co., Inc., 714 Howard Ave., New Orleans.

MASSACHUSETTS

Beckman & Co., C. E., 11-35 Commercial St., New Bedford.
Burke Co., J. H., 47-39 Brighton Ave., Boston.
Cushing, T. F., 349 Worthington St., Springfield 3.
Dean & Co., David B., 85 Conanicut St., Taunton.
DeMambro Radio Supply Co., 1111 Commonwealth Ave., Boston 15.
DeMambro Radio Supply, Inc., 729 Main St., Worcester.
Eastern Co., 620 Memorial Dr., Cambridge.
Electrical Supply Corp., 1739 Massachusetts Ave., Cambridge 40.
Flint Radio Co., 73 Troy St., Fall River.
Gerber Radio Supply Co., 1900 Columbus Ave., Roxbury 19.
Hatry & Young of Mass., Inc., 42-44 Cornhill St., Boston.
Hatry & Young of Mass., 639 Essex St., Lawrence.
Hatry & Young of Springfield, 169 Spring St., Springfield.
Herman Co., Louis M., 895 Boylston St., Boston.
Mayer Co., A. W., 895 Boylston St., Boston 15.
Melrose Sales Co., 407 Franklin St., Melrose 77.
Pittsfield Radio Co., 44 West St., Pittsfield.
Radio Electronic Sales Co., 46 Chandler St., Worcester 2.
Radio Maintenance Supply Co., 19-25 Central St., Worcester.
RADIO SHACK CORP., 167 Washington St., Boston. ADV. PG. 39.
Radio Wire Television, Inc., 110 Federal St., Boston.
Sager Electrical Supply Co., 201 Congress St., Boston.
Springfield Radio Co., Inc., 205 Dwight St., Springfield.
Springfield Sound Co., 147 Dwight St., Springfield.
Tarbell-Watters Co., West St. & Clapp Ave., Pittsfield.
Tarbell-Watters Co., 144 Chestnut St., Springfield.
Ware Radio Supply Co., 913 Centre St., Brockton 11.
Willett Radio Supply Inc., 11 Court St., Natick.

MICHIGAN

Duffy & Co., M. N., 2040 Grand River Ave., Detroit 26.
Earle Appliance Distrs., Inc., 814 First Ave., North Escanaba.
Electric Products Sales Co., 427 E. Michigan Ave., Lansing 29.
Electronic Supply Corp., 187 W. Michigan Ave., Battle Creek.
Electronic Supply Corp., 248 S. Pike St., Pontiac.
Ferguson Radio Supply Co., 602 W. Baltimore, Detroit 2.
Fitzpatrick Electric Supply Co., Inc., 444 Irwin St., Muskegon.
Fulton Radio Supply Co., 265 W. Cortland St., Jackson.
General Motors Corp., United Motors Service Div., 5044 W. Grand Ave., Detroit.
Industrial Electric Supply Co., 1839 Peck St., Muskegon.
K.L.A. Laboratories, Inc., 7462 Woodward Ave., Detroit 2.
Lifsey Distributing Co., 326-30 N. Saginaw, Flint 3.
Morley Brothers, 5443 Second Ave., Detroit 2.
Morley Brothers, 25 Ottawa Ave., W. Grand Rapids.
Morley Brothers, 115-129 N. Washington Ave., Saginaw.
Northwest Radio of Michigan, 435 Tamarack St., Laurium.
Orchard Distributing Co., 801 E. Genesee, Saginaw 11.
Radio Electronic Supply Co., 1112 W. Warren, Detroit 1.
Radio Electronic Supply Co., 443 Division Ave., S., Grand Rapids 3.
Radio Parts Co., Water & Millard Sts., Saginaw.
Radio Specialties, 456 Charlotte St., Detroit 1.
Radio Supply & Engineering Co., Inc., 85 Selden Ave., Detroit 1.
Radio Tube Merchandising Co., 508 Clifford St., Flint 3.
Ralston Co., Ralph M., 203 N. Park St., S., Kalamazoo.
RCA Victor Distributing Corp., 1400 Intervale Ave., Detroit.
Shand Radio Specialties, 205 W. Kearsley, Flint 3.
Straits Distributors, Inc., 208 S. Main St., Sheboygan.
Weidemeier Electronic Supply Co., 213-217 N. Fourth Ave., Ann Arbor.
Wetsenayer Electronic Supply Co., 2006 E. Michigan Ave., Lansing.
West Side Radio Supply, 4724 Michigan Ave., Detroit 10.
Wholesale Radio Co., 327 S. Division St., Grand Rapids.

MINNESOTA

Bauman Co., 711 W. Lake St., Minneapolis 8.
Bonn Co., Lew, 228 E. Superior St., Duluth.
Bonn Co., Lew, 1211 LaSalle Ave., Minneapolis 4.
Bonn Co., Lew, 141-147 W. 7th St., St. Paul 2.
Electronic Distributing Co., 1937 University Ave., St. Paul 4.
Hall Electric Co., 384 Minnesota St., St. Paul 1.
Mayer Co., E. C., 326 Washington Ave. N., Minneapolis.
Northwest Radio, 109 E. First St., Duluth 2.
Northwest Radio & Electronic Supply Co., 52 S. 12th St., Minneapolis 4.
Northwest Radio & Electronic Supply Co., 194 W. 4th St., St. Paul 2.
Radio Electric Service Co., 2451 Nicollet Ave., Minneapolis.
Radio Maintenance Co., 3016½ 27th St., S., Minneapolis 6.

S. M. Supply Co., 321 First Ave., SW, Rochester.
Stark Radio Supply Co., 71 S. 12th St., Minneapolis 4.

MISSISSIPPI

Cabell Electric Co., 422-24 S. Farish St., Jackson 110.
Gayer Supply Co. (Home Appliance Div.), 805 Alexander, Greenville.
Industrial Suppliers, Inc., Radio Div., Highway 80, Jackson.
Radio Supply Co., 909 24th Ave., Meridian.
Ryan Supply Co., 508-514 E. Pascagoula St., Jackson.
Ryan Supply Co., 814 21st. NE, Meridian.
Southern Distributors, Inc., 330 W. Capitol St., Jackson.
Swann Distributing Co., Inc., 717 W. Monument Jackson.

MISSOURI

Acme Radio Supply, 110 N. 9th St., St. Joseph.
Astle Radio Co., Walter, 1125 Pine St., St. Louis.
Brotherson, M., 515 N. Byers St., Joplin.
Brown Radio Co., Tom, 3924 Washington Ave., St. Louis.
Burstein-Applebee, 1012 McGee St., Kansas City.
Central Missouri Distributing Co., 409 W. McCarty St., Jefferson City.
Ebinger Radio & Supply Co., 2211 Gravois Ave., St. Louis 4.
Four State Radio & Supply Co., 201 Main, Joplin.
Gordon, Co., J. C., 1118 Pine St., St. Louis 9.
Henry Radio Co., 211-215 N. Main St., Butler.
Henshaw Radio Supply, 3619 Troost Ave., Kansas City.
Hollander & Co., Inc., 3900 W. Pine St., St. Louis.
Interstate Supply Co., 10th & Walnut Sts., St. Louis.
Manhattan Radio & Equipment, Inc., 2008 Grand Ave., Kansas City 8.
McGee Radio Co., 1225 McGee St., Kansas City.
Potter Radio Co., 1312 McGee St., Kansas City 6.
Radiolab, 1612 Grand Ave., Kansas City 8.
Radonics, 5040 Easton Ave., St. Louis.
Radonics, 2218 S. Jefferson St., St. Louis.
RCA Victor Distributing Corp., 2113-2115 Broadway, Kansas City.
Reed Radio & Supply, Harry, 805-809 Boonville St., Springfield.
St. Joseph Radio & Supply Co., 922-24 Francis St., St. Joseph.
Siedekum Electronic Supply Co., 902 S. Sprigg St., P. O. Box 221, Cape Girardeau.
Tri-State Radio & Supply Co., 436 Bartlet St., Poplar Bluff.
Van Sickle Radio Co., 1113 Pine St., St. Louis 1.

MONTANA

Electronic Supply Co., 214 Eleventh St., Billings.
Lindgren Co., Geo., 109 Central Ave., Great Falls.
Northwestern Auto Supply Co., 420 N. Broadway, Billings.
Smitty's Electronics, 126 W. Broadway, Butte.
Valley Motor Supply Co., 512-514 First Ave., S., Great Falls.

NEBRASKA

Hixes Radio Co., 1422 "O" St., Lincoln 8.
J B Distributing Co., 2855-57 Farnam St., Omaha 2.
Joachim Radio Supply, 1913 Broadway, Scottsbluff.
Leuck Radio Supply Co., 244 S. 11th St., Lincoln.
Nash Co., H. P., 2224 Harney St., Omaha.
Omaha Appliance Co., 17 St. Mary's St., Omaha.
Radio Equipment Co., 2820-22 Farnam St., Omaha.
Sides Co., 508 S. 19th St., Omaha.

NEVADA

Metcalf's Radio Supply, 207 N. Third St., Las Vegas.

NEW HAMPSHIRE

American Radio Corp., 510 Central Ave., Dover.
Dellmonico Radio Supply Inc., 1308 Elm St., Manchester.
Evans Radio, 10 Hill Ave., Concord.
Radio Service Laboratory, 1141 Elm St., Manchester.

NEW JERSEY

Acme & Harvey, 25 S. Warren St., Trenton 10.
All State Distributors, 90 Warren Place, Newark.
Apollo Distributing Co., 15 Stickpond St., Newark 2.
Continental Sales Co., 195-201 Central Ave., Newark.
Dale New Jersey, Inc., 79 Lock St., Newark.
General Radio Co., 207 N. Broadway, Camden.
Joe's Radio Shop, 67-69 S. Pearl St., Bridgeton.
Kaplan, Inc., Harrisburg & Atlantic Aves., Atlantic City.
Krich-Radisco, Inc., 422-432 Elizabeth Ave., Newark 8.
Lippman & Co., Aaron, 246 Central Ave., Newark 4.
M & H Sporting Goods Co., 1512 Atlantic Ave., Atlantic City.
Radisco Jersey City Inc., 713 Newark Ave., Jersey City 6.
Radisco Passaic, Inc., 294 Passaic, Passaic.
Radisco-Trenton, Inc., 126 S. Warren St., Trenton.
Terminal Radio Corp., 85 Cortlandt St., New York.
Traub Co., The, 112 Market St., Paterson.
Trenton Radio Corp., 26 Stockton St., Trenton 8.
Wilco Radio Distributors, 383 E. 138th St., New York.

NORTH CAROLINA

Carolina Radio Equipment Co., Inc., 105-107 E. Martin St., Raleigh.
Dalton-Hege Radio Supply Co., 140 Broadstreet Ave., Winston-Salem.
Dixie Radio Supply Co., 912-914 S. Tryon St., Charlotte.
Dixie Radio Supply Co., 423 S. Church St., Charlotte.
Frede Radio & Supply Co., Inc., 38 Biltmore Ave., Asheville.
Glasgow Supply Co., 224 S. Cedar St., P. O. Box 1997, Charlotte 1.
Johannesen Electric Co., Inc., 312-314 N. Eugene St., Greensboro.
Lambeth Electric Supply Co., 100 Burke St., Winston-Salem.
Long's Distributing Co., 68 N. Market St., Asheville.
Noland Co., Inc., 636 W. Fourth St., Winston-Salem.
Radiotronic Distributors Inc., 208 N. College St., Charlotte.
Signal Radio Supply, Goldsboro.
Southeastern Radio Supply Co., 416 Market St., Greensboro.
Southeastern Radio Supply Co., 411-15 Hillsboro St., Raleigh.
Southern Radio Corp., 1625 W. Morehead St., P. O. Box 2356, Charlotte 1.

NORTH DAKOTA

Bristol Distributing Co., 2121 Front St., Fargo.
Dakota Electric Supply Co., 1017-23 Fourth Ave., N., Fargo.
Hayer Co., F. C., 814 First Ave., North P. O. Box 1657, Fargo.
McFall Radio Co., 58 N. Main St., Box 1055, Minot.
Quarnstrom, Brink & Riebold, 122 First St., Bismarck.
Radio Equipment Co., 624 Second Ave., N., Fargo.

OHIO

Armstrong Radio Supply, 216 Second St., SE, Canton 2.
Burroughs Radio Co., 711 Second St., NW, Canton 3.
Chambers Electronic Supply Co., Inc., 1667-71 Central Parkway, Cincinnati.
D & N Radio Supply Co., Inc., 156 S. 3rd St., Steubenville.
Eberle's Radio Supply, 522 W. Main St., Springfield.
El-A-Co., 121 Lodi St., Elyria.
Electronic Supply Corp., 219 N. 4th St., Columbus 15.
Goldhamer, Inc., 2239 E. 14th St., Cleveland.
Hamburg Brothers, 320 E. Federal St., Youngstown.
Herrlinger Distributing Co., 1436 Vine St., Cincinnati 10.
Howard's Electronic Supply, 135 17th St., Toledo 2.
Hughes-Peters, Inc., 1128 Sycamore St., Cincinnati.
Hughes-Peters, Inc., 111 E. Long St., Columbus 15.
Hughes-Peters, Inc., 300 W. 5th St., Dayton.
Hutch & Son, 125 S. Elizabeth St., Lima.
Jantsen Radio, Warren.
Lima Radio Parts Co., 641-43 N. Main St., Lima.
Main Line Cleveland, Inc., 5005 Euclid Ave., Cleveland 3.
Mainline Distributors, Inc., 374-384 S. Erie St., Toledo 2.
Martin Co., M. H., 50 Charles Ave., SE, Massillon.
Morrison's Radio Supply, 331 Center St., Ashtabula.
Northern Ohio Laboratories, 2073 W. 85th St., Cleveland.
Northwestern Radio Co., 116 W. Spring St., Lima.
Ohio Appliances, Inc., Daylight Bldg., E. Court & 6th St., Cincinnati.
Ohio Appliances, Inc., 430 Leo St., Dayton 5.
Oliver Theatre Supply Co., Inc., 1701 E. 23rd St., Cleveland.
Olson Radio Warehouse, Inc., 73 E. Mill St., Akron 8.
Olson Radio Warehouse, 2020 Euclid Ave., Cleveland.
Pioneer Radio Supply Co., 2115 Prospect Ave., Cleveland 15.
Progress Radio Supply Co., 413-415 Huron Rd., Cleveland.
Radio & Electronics Parts Corp., 3235 Prospect Ave., Cleveland 15.
Radio Parts Co., 309-11 W. Commerce St., Youngstown.
Radio & Refrigeration Supply Co., 1220 Jackson St., Cincinnati.
Ross Radio Co., 325 W. Federal St., Youngstown 3.
Schuster Electric Co., The, 321 Sycamore St., Cincinnati.
Sreco, Inc., 135 E. 2nd St., Dayton 2.
Steinberg's Inc., 633 Walnut St., Cincinnati 2.
Stotts-Friedman Co., 620-22 S. Main St., Dayton 2.
Sun Radio Co., The, 110 E. Market St., Akron 8.
Thompson Radio Supplies, 218 E. Gay St., Columbus 15.
Thompson Radio Supplies, 135 S. 6th St., Zanesville.
Toledo Radio Specialties, 1215 Jackson St., Toledo 2.
United Radio, Inc., 1314 Vine St., Cincinnati.
Warren Radio Co., 479 S. Main St., Akron.
Warren Radio Co., 222 S. Elizabeth, Lima.
Warren Radio Co., 1320 Madison St., Toledo 2.
Whitehead Radio Co., 124 E. Long St., Columbus 5.
Winteradio, Inc., 1468 W. 25th St., Cleveland 13.

OKLAHOMA

Electronic Supply Co., 212 NW Tenth St., Oklahoma City 3.
Miller Co., Jackson, 111-119 E. California, Oklahoma City.

NEW MEXICO

Walker Radio Co., Inc., 114 W. Granite, P. O. Box 921, Albuquerque.

NEW YORK

Adirondack Radio Supply, 32 Guy Park Avenue, Amsterdam.
Ahrens Electronic Distributors, 29-27 Henry St., Kingston.
ARROW ELECTRONICS, INC., 82 Cortlandt St., New York 1. ADV. PG. 230.
Barclay New York, Inc., 139 Cedar St., New York.
Barker Roses' Kimball, Inc., 511 Baldwin St., Elmira.
Beacon Electronics, Inc., 14 Catherine St., Utica.
Beacon Electronic Distb., 108 Lincoln Bldg., Watertown.
Bernay Distributing Co., 506 Coney Island Ave., Brooklyn.
Berndt, W. E., 653-55 S. Warren St., Syracuse.
Bickford Bros. Co., 1209 Broadway, Buffalo.
Bickford Bros. Co., 208 St. Paul St., Rochester 4.
Branham Electrical Supply Co., John, 304 W. 55th St., New York.
Bruno Electronic Corp., 103 Lafayette St., New York.
Bruno-New York, Inc., 460 W. 34th St., New York 1.
Certified Radio Supply, 45 Cottage St., Middletown.
Chamrose Radio Stores, Inc., 170-16 Jamaica Ave., Jamaica 3.
Chef Electronics, 104 Main St., Poughkeepsie.
Dale Distributing Co., Inc., 40 E. 32nd St., New York.
Dalis, Inc., H. L., 175 Varick St., New York 14.
Dare's Radio Service, 22 E. Genesee St., Auburn.
Davis Electronics Corp., 204 Main St., Hempstead.
Davis Radio Distributing Co., 66 E. 3rd St., Mt. Vernon.
Dymac, Inc., 2329 Main St., Buffalo 14.
Electric City Radio Supply, 1626 Union St., Schenectady.
Electronic Laboratories & Supply Co., 915 Lincoln Ave., Utica 4.
Electro-Tech Equipment Co., Inc., 117 Lafayette St., New York 13.
Electronic Equipment Co., 2912 Atlantic Ave., Brooklyn.
Federal Radio Supply Co., 188 State St., Binghamton.
FEDERATED PURCHASER, INC., 66 Dey St., New York 4. ADV. PG. 273.
Fischer Distributing Co., Inc., 118 Duane St., New York 7.
Fordham Radio Supply, 2269 Jerome St., New York 53.
Fort Orange Radio Distributing Co., 642-44 Broadway, Albany.
Fulton County Distr. Co., 14 Bleeker St., Gloversville.
Genesee Radio & Parts Co., 205 Genesee St., Buffalo 3.
Gershuff Elect. Sup. Corp., 220 W. 83rd St., New York.
Goler Elect. Sup. Corp., 225 S. Broadway, Yonkers.
Graybar Electric Co., 420 Lexington Ave., New York. General Offices—branches in 105 principal cities.
Green Radio Distributors, 482 Sutter Ave., Brooklyn 7.
Harrison, Fred C., 108 W. Church St., Elmira.
HARRISON RADIO CORP., 172-31 Hillside Ave., Jamaica, L. I. ADV. PG. 265.
Harrison Radio Co., 12 W. Broadway, New York 7.
HARVEY RADIO CO., 103 W. 43rd St., New York 18. ADV. PG. 104.
Hornbeam Distributing Co., 67-15 Fresh Pond Rd., Brooklyn.
Hornbeam Distributing Co., 1630 Bedford Ave., Brooklyn.
Hornbeam Distributing Co., 4117 Ft. Hamilton Pkwy., Brooklyn 19.
Hornbeam Distributing Co., 41-01 16th Ave., Brooklyn.
Island Radio Distributors, 412 Fulton Ave., Hempstead, L. I.
Johnson Radio & Elect. Equip. Co., 35 Harrison St., Jamestown.
L & S Radio Sales Co., 142-144 North St., Middletown.
LEGRI-S-CO., INC., 130 W. 102nd St., New York 25. ADV. PG. 182.
Leonard Radio, Inc., 69 Cortlandt St., New York 7.
Madison Radio Parts, 192-196 Clinton Ave., Rochester 4.
MILO RADIO & ELECTRONICS CORP., 200 Greenwich St., New York. ADV. PG. 150.
Morris Distributing Co., Inc., 196 Water St., Binghamton.
Morris Distributing Co., 412 S. Clinton St., Syracuse.
National Radio Distributors, 899 Southern Blvd., New York 59.
National Radio Parts Dist. Co., 611 New York Ave., Brooklyn 3.
NEWARK ELECTRIC CO., INC., 242 W. 55th St., New York. ADV. PG. 201.
Niagara Radio & Parts Co., 1518 Main St., Niagara Falls.
Norman Radio Distributors, Inc., 94-29 Merrick Rd., Jamaica 5.
O & W Radio Co., 141 Cedar St., New York.
Peerless Electronic Distributors Corp., 76 Willoughby St., Brooklyn.
Peerless Radio Distributors, Inc., 92-32 Merrick Rd., Jamaica, L. I.
Powell Radio Supply, 142 W. 169th St., New York 52.
R. T. A. Distributors, Inc., 56 Broadway, Menands, Albany 7.
Radio Equipment Corp., Inc., 145-151 Genesee St., Buffalo 3.
Radio Wire Television, Inc., 542 E. Fordham Rd., Bronx.
Radio Wire Television, Inc., 100 Sixth Ave., New York 13.
Radionic Equipment Co., 170 Nassau St., New York.
Ray Distributing Co., 188 Glen St., Glens Falls.
Roberts & O'Brien, 714-716 Park Ave., Syracuse 4.
Rochester Radio Supply Co., 114 St. Paul St., Rochester 4.
Sanford Electronics Corp., 157 Chambers St., New York.
Slate & Co., 2755 Webster Ave., New York 58.
Smith, Inc., Stewart, 325 E. Water St., Syracuse.
Stallman of Ithaca, 123-131 S. Tioga St., Ithaca.
Stan-Burn Radio & Electronics Co., 558 Coney Island Ave., Brooklyn 18.
Stan-Burn Radio & Electronics Co., 1697 Broadway, New York 19.
Standard Electronics Co., 1497 Main St., Buffalo 8.
Standard Parts Corp., 235 Main St., Hempstead, L. I.
SUN RADIO & ELECTRONICS CO., INC., 122-124 Duane St., New York 7. ADV. PG. 61.
Sylvan-Wellington Co., 269 Canal St., New York 13.
Taylor, C. E., 465 Central Ave., Albany 5.
TERMINAL RADIO CORP., 85 Cortlandt St., New York City. ADV. PG. 240.
Trojan Radio Co., Inc., 426 River St., Troy.
United Radio & Electric Co., 47 W. 63rd St., New York 23.
Vaeth Electric Co., 35 Genesee St., Utica.
Vermont Hardware Co., Inc., 40 E. Main St., Malone.
Westchester Electronic Supply Co., 420 Mamaroneck Ave., White Plains.

Patterson Radio Supply Co., 211 E. 24th St., Tulsa.
Radio, Inc., 1000 E. Main St., Tulsa 3.
Radio Supply Inc., 724 N. Hudson St., Oklahoma City.
S & S Radio Supply, 721 S. Detroit, Tulsa.

OREGON

Appliance Wholesalers, 600 NW 14th St., Portland 9.
Bargart Supply, 1130-35 SW Washington St., Portland 5.
Carlson, Hatton & Hay, Inc., 96 E. Tenth Ave., Eugene.
Central Distributors, 1191-33 S. W. Washington, Portland 5.
Cressey & Allen, 19 Commercial St., Portland 4.
Harper Megyer, Inc., 1506 NW Irving, Portland.
Johnson Co., Inc., 422 NW Eighth Ave., Portland.
Northwest Radio Supply Co., Inc., 717 SW Ankeny St., Portland.
Portland Radio Supply Co., 1300 W. Burnside, Portland 9.
Radio Electronics Co., 9th & Commercial, Astoria.
Stubble Electric Co., 33 NW Park Ave., Portland 9.
Tracey & Co., Inc., 917 NW Glisan, Portland 9.
United Radio Supply Inc., 179 W. 4th St., Eugene.
United Radio Supply, Inc., 22 NW 9th Ave., Portland 9.
Walker Co., Earl G., 305 W. Jackson, Medford.

PENNSYLVANIA

A. C. Radio Supply Co., 1539 W. Passyunk Ave., Philadelphia 45.
A. G. Radio Parts Co., 3515 N. 17th St., Philadelphia 40.
A. G. Radio Parts Co., 628 Schuylkill Ave., Reading.
Allied Electric Appliance Parts Inc., 3640 Lider St., Philadelphia 40.
Almo Radio Co., 509 E. Arch St., Philadelphia.
B & R Electric Co., St. Mary's.
Baker Radio Electric, 111 Johns St., Johnstown.
Barley Co., Geo. D., 29 E. Vine St., Lancaster.
Barley Co., Geo. D., 113 N. Washington St., Pottstown.
Barley Co., Geo. D., 2nd & Penn Sts., Reading.
Barnett Bros. Radio Co., 146 N. 7th St., Philadelphia.
Boss Radio Electric Supply, 61-63 S. Broad St., Bethlehem.
Cambria Equipment Co., 12 Iron St., Johnstown.
Commodore Co., 963 Liberty Ave., Pittsburgh 22.
Capitol Records Inc., Scranton.
Consolidated Radio Co., 612 Arch St., Philadelphia 6.
D & H Distributing Co., 311 S. Cameron St., Harrisburg.
D & H Distributing Co., 251 S. Main St., W-Kes-Barre.
Delaware Co., V., 1011 W. 9th St., Erie.
Fine Arts Radio of Pa., Inc., 223-225 N. Broad St., Philadelphia 7.
FEDERATED PURCHASER, INC., 219 Hamilton St., Allentown, Adv. Pg. 213.
Fisher Scientific Co., 711-723 Forbes St., Pittsburgh 19.
General Radio & Electronics, 287 S. Main St., Wilkes-Barre.
Grisbar Electric Co., 910 Cherry St., Philadelphia.
Harvey Hall, 305 Penn Ave., Pittsburgh 22.
Hertzler & Fahnestock, Inc., 522 Market St., Philadelphia 6.
Hollenback's Radio Supply, 2221 Eighth Ave., Altoona.
J. M. S. Distributors, 646 W. Market St., York.
Jordan Electronic Co., 1130 German St., Erie.
Kennedy's Radio Supply, 1500 Seventh Ave., Altoona.
Lenoir Radio Co., Inc., Nat., 4241 Lancaster Ave., Philadelphia 31.
Lackenbach & Johnson, Inc., 1034 Chestnut St., Allentown.
M. & W. Sporting Goods Co., 512 Market St., Philadelphia 6.
Mansfield Co., M. V., 937 Liberty Ave., Pittsburgh.
Marshall Co., 2101-201 Anderson St., Pittsburgh.
Meyer Electronic Supply Co., Inc., 330 E. Ninevah St., Philadelphia.
Penn Electronic Parts Co., 5365 Frankford Ave., Philadelphia.
Pepco, Pike P., 548-550 Wyoming Ave., Scranton 4.
Radio Distributing Co., 140 S. Second St., Harrisburg.
Radio Electric Co. of Pa., Inc., 1042 Hamilton St., Allentown.
Radio Electric Service Co. of Pa., Inc., 916 Northumberland St., Dubois.
Radio Electric Service Co. of Pa., Inc., 3133 German-town Ave., Philadelphia.
Radio Electric Service Co. of Pa., Inc., 5810 Market St., Philadelphia 39.
Radio Electric Service Co. of Pa., Inc., NW Fur. 9th & Arch Sts., Philadelphia.
Radio Parts Co., 329 Liberty Ave., Pittsburgh.
Radio Parts Co., 47 N. Gallatin Ave., Uniontown.
Radio Service Co., 346 S. Main St., Wilkes-Barre.
Ryan & Co., Raymond, 1108 & Walnut Sts., Philadelphia.
Radio Electric Co., 1007 Arch St., Philadelphia.
Scranton Radio & Television Supply Co., 519-521 Mulberry St., Scranton 2.
Smith Co., Lincoln B., 119 Franklin Ave., Scranton.
Steinberg & Co., Albert, 1520 N. Broad St., Philadelphia 21.
Superior Distributing Co., 5114 Liberty Ave., Pittsburgh 24.
Test Equipment Sales Co., Inc., 1505 Race St., Philadelphia.
Tyrone Co., 632 Grant St., Pittsburgh 19.
Warren Radio Co., 1185 State St., Erie.
Wile, A. H., 218 S. 11th St., Philadelphia 7.
Williamsport Radio Supply, 519 W. Third St., Williamsport 29.
York Radio & Refrigeration Parts, 245 A. Market St., York.
Young Bros. Electronics Inc., 1909-15 Peach St., Erie.
Zimmerman Wholesalers, 86 Morgantown St., Uniontown.

RHODE ISLAND

Daniberta Co., Wm., 129 Regent St., Providence.
DeMambro Radio Supply, Inc., 90 Broadway, Providence.
Eddy & Co., Inc., 45 Hospital St., Providence.
Edwards Co., W. H., 44 Broadway Providence 3.

SOUTH CAROLINA

Carolina Radio Supply Co., Inc., 227 W. Washington St., Greenville.
Dixie Radio Supply Co., 1315 Main St., Columbia.
Dixie Radio Supply Co., 22 Richardson St., Greenville.
Noland Co., Inc., 162 Morgan Ave., Spartanburg.
Radio Laboratories, 215 King St., Charleston.

SOUTH DAKOTA

Burghardt Radio Supply, 124 First Ave., NW, Watertown.
Power City Radio Co., 209 S. First Ave., Sioux Falls.
Warren Radio Supply, 215 S. Indiana Ave., Sioux Falls.

TENNESSEE

Bluff City Distributing Co., Inc., 909-7 Union St., Memphis 3.
Bonar Appliance Co., Inc., 520 Western Ave., Knoxville.
Boyd Electronic Supply, 1153 Union Ave., Memphis.
Braid Electric Co., 109 Eleventh Ave., South, Nashville.
Chemcity Radio & Electric Co., 12 Emory Park, Knoxville 17.
Corne Radio Supply, 825 Cherry St., Chattanooga.
Electra Distributing Co., 2914 West End Ave., Nashville 4.
Keith-Simmons Co., Inc., Cummins Station, Nashville.
Lavender Radio Supply Co., Inc., 1012 Union Ave., Memphis.
Lynch & Co., Inc., S. H., 1049 Union, Memphis.
McClung & Co., Inc., C. M., 501 W. Jackson St., Knoxville 7.
Memphis Inc., 1071 Union Ave., Memphis 3.
Mills Morris Co., 171-175 S. Lindsey St., Memphis 1.
Radio & Appliance Corp., 4 Commins Station, Nashville 3.
Radio & Appliance Dist., Inc., Corner Main & Broad Sts., Chattanooga.
Radio Electric Supply Co., 210 Cherokee St., Kingsport.
Randolph & Cole Inc., 1516 Church St., Nashville.
Roden Electrical Supply Co., 808 N. Central Ave., Knoxville.
Rush Co., L. K., 304 S. Baltimore St., Dickson.
Specialty Distributing Co., Inc., 204 Chestnut St., Chattanooga.
W. & W. Distributing Co., 477 Madison Ave., Memphis.

TEXAS

Adams Co., 1714 Cedar Springs at Akard, Dallas.
All State Distributing Co., 2407 Ross Ave., Dallas 1.
Amateur Headquarters & Supply Co., PO box 5086, Beacon Hill Sta., San Antonio.
Automatic Sales Co., 305 M & M Bldg., Houston 2.
Brown & Co., A. R., 1318 Polk Ave., Houston 2.
Bussaker Electronic Equip. Co., 1721 Waugh Drive, Houston.
Clark & Sons Radio Supply, 1204 E. Ohio Ave., Wichita Falls.
Crabtree's Wholesale Radio, 2808 Ross Ave., Dallas 1.
Dallas Electric Supply Co., 1400 Magnolia St., Dallas 2.
Denson Radio Supply, 310 W. Woodward, Denison.
Electronic Equipment Co., 901 E. 5th St., Fort Worth.
Electronic Equipment & Engineering Co., 1210 & Madison Sts., Brownsville.
Electronic Equipment & Eng. Co., 1310 S. Staples St., Corpus Christi.
Fort Worth Radio Supply Co., 1201 Commerce St., Fort Worth.
Geophysical Supply Co., PO Box 2214, Houston 1.
Hall, Inc., R. C. & V. F., 1408 Clay Ave., Houston.
Hargis Co., Box 716, Austin.
Harlan Co., Inc., 1305 Austin Ave., Waco.
Harrison Equipment Co., 1422 San Jacinto, Houston.
Houston Radio Supply Co., Inc., City at La Branch, Houston.
Lavender Radio Supply Co., 520 E. 4th St., Texarkana.
Lavender Radio Supply Co., 110 Saxon St., Tyler.
Lynch & Co., Inc., S. H., 2101-3 Pacific Ave., Dallas.
Lynch & Co., Inc., S. H., 4411 Calhoun St., Houston.
Lynch & Co., Inc., S. H., 241 Broadway, San Antonio.
Mineral Radio Inc., 814 S. Presa St., PO Box 2487, San Antonio.
Mississippi Radio Distributing Co., 220 Willow Ave., PO Box 4045, Beaumont.
Mooney Radio Supply Co., 1104 Grape St., Wichita Falls.
R & R Electronics Co., 1234 North First, Abilene.
R & W Electronic Co., 416-18 W. Tenth, Amarillo 1.
R & R Supply Co., Inc., 706 Main St., Lubbock.
Radio Parts Co., 1422 Polk Ave., Houston 4.
Ra-Tel, Inc., 2123 Cedar Springs, Dallas 1.
Radio & Television Parts Co., 118-120 7th St., San Antonio 2.
Rawls Radio Supply, 720 N. Stanton St., El Paso.
Recorders Inc., 1810 Commerce St., Fort Worth.
Sharp Co., Inc., 1810 Mayon St., Fort Worth.
South Texas Radio Supply, 807 S. Presa St., San Antonio.
Southwest Radio Supply, 1620 N. Harwood St., Dallas.
Standard Radio Supply Inc., 404 Lavaca St., Austin.
Sterling Radio Products Co., 1402 McKinney St., Houston.
Straus-Frank Co., 4800 Leeland, Houston.
Straus Frank Co., 301 S. Flores St., San Antonio.
Sutton's Wholesale Electronics, Bill, 601 Commerce St., Fort Worth 2.
Wamlow & Co., 912 N. Peak St., Dallas.
West Texas Radio Supply, 1026 West Sixth, Amarillo.
Wiess-Devilbiss Co., 513-15 S. Staples St., Corpus Christi.
Wilkinson Brothers, 2406 Ross Ave., Dallas.

UTAH

Kline Distributing Co., 316 Second South, PO Box 1470, Salt Lake City 11.
Standard Supply Co., Box 2105, Salt Lake City.

VERMONT

Vermont Hardware Co., Inc., 160 Flynn Ave., Burlington.
Vermont Hardware Co., Main & Bridge Sts., White River Junction.

VIRGINIA

Ashman Distributing Co., 807 Granby St., Norfolk.
Baker Sales Co., Inc., H. C., 19 Franklin Road, Roanoke.
Bristol Radio Supply Corp., 31 Moore St., Bristol.
Eastern Electric Co., 920 Commerce St., PO Box 943, Lynchburg.
Hartley & Co., M. A., 827 N. Central Ave., Staunton.
J & J Appliance Co., 211 William St., Fredericksburg.
Johnston-Gaskin Co., 3023 W. Marshall St., Richmond 21.
Leonard Electronic Supply Co., 131 Center Ave., NW., Roanoke.
Lynchburg Battery & Ignition, 406 Fifth St., Lynchburg.
Noland Co., Inc., 27th St. & Virginia Ave., Newport News.
R & M Radio Co., 2701 Wilson Blvd., Arlington.
Radio Equipment Co., 921 W. 21st St., Norfolk 10.
Radio Parts Distributing Co., 128 W. Olney Rd., Norfolk 10.
Radio Supply, 711 Granby St., Norfolk 10.
Radio Supply Co., 3302 W. Broad St., Richmond 21.
Rucker Radio Wholesalers, 1406 N. Moore St., Arlington.
Wadree Supply Co., 800 W. Cary St., Richmond 21.
Womack Electric & Supply Co., 502-504 Craycraft St., Danville.
Wyatt-Cornick Distributors, Inc., 951 W. 21st St., Norfolk.
Wyatt-Cornick Inc., 14th & Grace Sts., Richmond 19.

WASHINGTON

Associated Industries, 1752 Rainier Ave., Seattle 44.
Columbia Electric & Mfg. Co., South 123 Wall St., Spokane 8.
C & G Radio Supply, 714 St. Helens Ave., Tacoma 2.
Carleton Radio Supply, Second & Bell Sts., Seattle.
General Radio Inc., 100 Wall St., Seattle 1.
Harper Megyer, Inc., 960 Republican, Seattle 9.
Harper Megyer Inc., 714 N. Division St., Spokane.
Kar Radio & Electric Co., PO Box 1, Walla Walla.
Loy & Nord, 112 S. Second St., Yakima.
Motert Theatre Supply, Inc., 2400 Third Ave., Seattle 1.
Pringle Radio Wholesale Co., 2516 Colby Ave., Everett.
Radio Electric Supply Co., 2722 Second Ave., Seattle 1.
Radio Products Sales Co., 1214 First Ave., Seattle.
Seattle Radio Supply Inc., 2317 2nd Ave., Seattle 1.
Standard Sales Co., 1219 W. First Ave., Spokane 8.
Stearns Co., A. T., 741 Broadway, Tacoma.
Watkins Supply Co., 110 Grant Ave., Bellingham.
Washington Distributors, 119 Madison Ave., Seattle.
Western Electronic Supply Co., 2609 First Ave., Seattle 1.
White Radio Supply Co., S. Tacoma Ave., Tacoma 9.
Yakima Wholesale Radio Co., 206 S. 6th Ave., Yakima.
Zabrist Co., Herb L., 2120 Westlake Ave., Seattle 1.

WEST VIRGINIA

Kilp & Irwin, Inc., 314 Eleventh St., Huntington.
Randle & Hendricks, 136 1/2 E. Main St., Bridgeport.
Whitlatch Radio Co., Inc., 161 Warfield Ave., Bluefield.

WISCONSIN

Acme Radio Supply Corp., 512 W. State St., Milwaukee 3.
Appleton Radio Supply Co., 1217 N. Richmond St., Appleton.
Central Radio Parts Co., 1723 W. Fond du Lac Ave., Milwaukee 5.
Electronic Service Distributors, Inc., 2450 W. Lisbon Ave., Milwaukee 5.
Harris Radio Corp., 115 N. Tenth St., Manitowoc.
Marsh Radio Supply Co., 526 W. State St., Milwaukee 3.
Neils Electronic Distributors, 306 N. Chestnut St., Green Bay.
Northern Electrical Distributors, 709 S. Broadway, Green Bay.
Pickrel Co., G. M., Main at Ninth St., Menominee.
Radio Distributors, 701 E. Johnson St., Madison 3.
Radio Parts Co., Inc., 538 W. State St., Milwaukee 3.
Radio Service & Supply Co., Inc., 615 Third St., Wausau.
S. M. Supply Co., 409 11 S. Barstow St., Eau Claire.
Satterfield Radio Supply, 826 W. Gorham St., Madison.
Standard Radio Parts Co., 5744 State St., Racine.
Triple Electric Co., 112 N. Broadway, Milwaukee 2.
Valley Radio Distributors, 518 N. Appleton St., Appleton.

WYOMING

Casper Supply Co., 444-448 S. Center St., Casper.
Hodge Radio & Supply, 2008 Carey Ave., Cheyenne.

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- ✓ Standard components for TV
- ✓ Held to rigid specifications
- ✓ Competitively priced
- ✓ Built to your specifications

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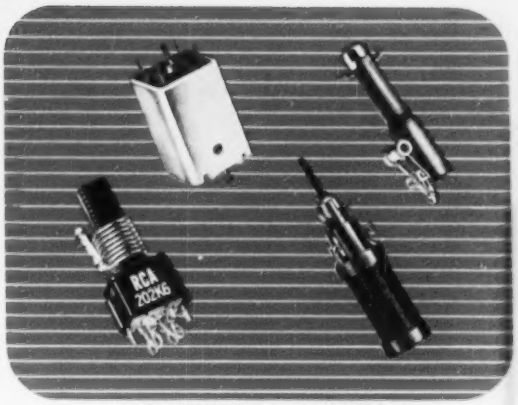
RCA's line of major television components are "originals" designed for top performance with complementary components and tubes. They are built to exacting electrical and mechanical specifications.



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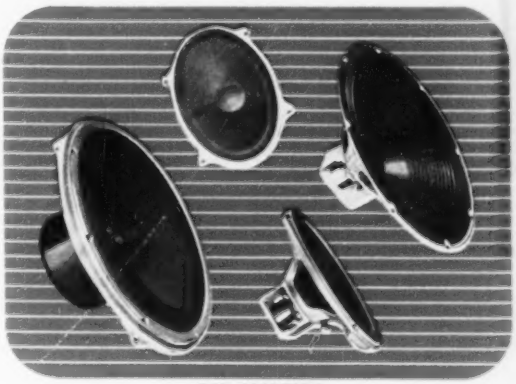
* * *

RCA Application Engineers . . . with their long experience in circuit and tube design . . . are ready to cooperate with you in the adaptation of RCA components to your specific designs. For further information, write RCA, Commercial Engineering, Section F455, Harrison, N. J. . . . or consult the directory on the back cover for the nearest regional office.



RCA SPEAKERS

RCA speakers include standard PM types ranging from the smaller sizes up to the high-fidelity 15" Duo-Cone speaker. They have power-handling capabilities up to 25 watts. There's a size and type for every requirement.

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RADIO CORPORATION of AMERICA

ELECTRONIC COMPONENTS **HARRISON, N. J.**

12 REASONS WHY...

it pays equipment manufacturers to deal with RCA

1. RCA Application Engineering Service—Twelve field engineering specialists devote their time *exclusively* to the design problems of equipment manufacturers. They're ready to pitch in and help you at any time.

2. RCA Application Engineering Laboratories—RCA maintains application laboratories at Harrison, Lancaster, and Chicago. The services of these laboratories are at the disposal of all RCA tube and component customers.

3. RCA Circuit Investigations—RCA carries on independent research in circuit design for the exclusive benefit of its tube and component customers. Engineering reports are provided as a free service.

4. RCA Tube and Component Development—RCA works years ahead in tube and component design—anticipates future requirements. That's why you get the types of tubes and components you want *when* you want them.

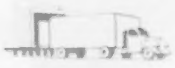
5. RCA Engineering Literature—RCA technical bulletins and data, covering the specifications and operating conditions of RCA tubes and components, are the most authoritative and comprehensive in the field.

6. RCA Manufacturing Facilities—RCA tubes and components are manufactured in modern plants equipped largely with RCA-designed, precision machinery—your assurance of uniform, dependable quality tubes and components.

7. RCA Quality Control—Quality controls begin with the raw material and are followed through in every successive step of manufacture and assembly. That's why RCA tubes and components are consistently reliable.

8. RCA Sales and Customers' Service—A staff of seasoned sales representatives are within convenient reach. They're available *when* you want them. In addition, a staff at the Home Office devotes its time *exclusively* to expediting your orders.

9. RCA District Offices—RCA maintains three conveniently located district offices in Harrison, Chicago, and Los Angeles to serve equipment manufacturers. You can get prompt service from the office nearest you.



10. RCA Distribution—RCA maintains bulk tube and component stocks in three warehouses strategically located in Jersey City, Chicago, and Los Angeles for quick service.

11. RCA Pricing—Mass-production techniques and the RCA "Preferred Type Plan" have consistently operated to reduce manufacturing costs—which mean lower prices to you.

12. RCA Engineering Leadership—The vast resources of experience and ability that account for RCA's engineering leadership in tubes and components, are of direct benefit to RCA customers . . . a final reason why it pays to deal with RCA.

Sales and Product Directory

1. General sales information or requests for application engineering assistance on receiving and television picture tubes, communications and industrial tubes, power tube fittings, electronic components, and test and measuring equipment:

Equipment Sales Field Representatives at the RCA Sales Office nearest you:

City and State	Street Address	Telephone No.
Harrison, N. J.	415 S. 5th St.	Harrison 6-8000
Chicago 11, Ill.	589 E. Illinois St.	Whitehall 4-2900
Los Angeles 13, Calif.	420 S. San Pedro St.	Madison 9-3671

2. Inquiries relative to technical bulletins: Commercial Engineering, RCA, 415 South 5th Street, Harrison, N. J.

3. Orders and inquiries on orders: Tubes: RCA warehouse serving you:

Jersey City Warehouse, RCA 24 Exchange Place Jersey City 2, N. J. Phone: Bergen 4-2100	Chicago Warehouse, RCA 589 E. Illinois St. Chicago 11, Ill. Phone: Whitehall 4-2900

Los Angeles Warehouse, RCA, 420 S. San Pedro St.
Los Angeles 13, Calif. Phone: Madison 9-3671

RADIO CORPORATION of AMERICA

ELECTRON TUBES AND COMPONENTS — **HARRISON, N. J.**